THE BUILDER

VOL. CII.—No. 3603. FEBRUARY 23, 1912.

CONTENTS.

	PAGE
Labour Questions and Nationalisation and Insurance	199
The Architectural Societies of France.—II.	200
Notes	201
The Royal Institute of British Architects (with Illustrations)	202
The Architectural Association (with Illustrations)	204
Architectural Societies	207
General News	207
Competition News	208
Correspondence	208
Intercommunication Column	208
Fifty Years Ago	208
Editorial Summary	209
Meetings	209
Notes to Illustrations	209
Monthly Review of Engineering:—	
Reinforced Concrete in Great Britain.—II. (with Illustrations)	211
The Æsthetic Treatment of Concrete	213
Monthly Review of Engineering (*contd.*):—	
The York Tower Collapse	214
Notes	214
The Building Trade:—	
The Institute of Builders	215
Seventh Manchester Building Trades Exhibition	216
Standard Time Rates of Wages	216
Builders' Clerks' Benevolent Institution	216
General Building News	216
Applications under London Building Acts, 1894 to 1909	217
Projected New Buildings in the Provinces	217
The Royal Academy Lectures	218
The Carpenters' Hall Lectures	218
Books (with Illustration)	219
The London County Council	219
Cottages at Wallsend-on-Tyne (with Illustrations)	220
Traffic Report of the Board of Trade	220
Legal Column	221
Law Reports	221
London Councils	222
Obituary	222
Patents	223
Trade Catalogues	223
List of Competitions, Contracts, etc., Open	224
The Quantity Surveyors' Association	226
Foreign and Colonial	226
Some Recent Sales	226
Prices Current	226
Tenders	227

Illustrations.

Stafford Public Library Competition:—
- Selected Design, by Messrs. Briggs, Wolstenholme, & Thornely.
- Second Premiated Design, by Messrs. Sutton & Gregory.

Illustrations of Mr. Paul Waterhouse's Architectural Association Paper on "Bridges":—
- Limburg on the Lahn, from a Sketch by the late Alfred Waterhouse, R.A.
- Florence, from a Sketch by the late Alfred Waterhouse, R.A.

The Bridge of Prague. From a Sketch by the late Alfred Waterhouse, R.A.
(Illustrating Mr. Paul Waterhouse's Architectural Association Paper on "Bridges.")

LABOUR QUESTIONS AND NATIONALISATION AND INSURANCE.

THE Labour Party moved an amendment to the Address in which was embraced not only that quack panacea for all ills, a statutory minimum wage, but also a resolution for the nationalisation of "railways, mines, and other monopolies." As has been the case when this latter part of the resolution has been brought before the Trade Union Congress during the past ten years, no attempt was made to justify the motion or to show how nationalisation is to be effected, or how it would affect the wage-earners; the resolution was simply left to speak for itself, serious argument being impossible. The most significant remark in the whole debate was indeed a wholly irrelevant observation

by Mr. Keir Hardie, that as soon as the Insurance Act came into force there would be a universal agitation among the working classes for an extra fourpence a week on their wages to enable them to pay their contributions, which would thus be put upon the employers. This is precisely the attitude which we have always predicted would be assumed by the working classes towards this Act, and it is worthy of attention. In those trades where unemployment insurance is also introduced the contributions of employer and employed will amount to 1s., and if national strikes are likely to be resorted to in order to place the whole of this burden on employers, or if there is even a remote risk of such consequences, the Act on this single ground stands condemned.

In the present agitation in all industries for increased wages the ground put forward for an artificial interference with wages is the rise in the necessities of life; and both, or all, parties in the State profess to recognise some reason in the demand based upon this cause. We venture to suggest that when this cause alone is put forward and accepted the real question is, in fact, being begged, and it is necessary to go further back and inquire what is the cause of the increased cost of living? The answer to this question is, at any rate in part, simple, as the increased cost of living is, to some extent, due to the remedial legislation and the increased taxation that has marked the past decade. The extension of the Factory Acts in 1901, the introduction of Workmen's Compensation in 1897 and its great extension in 1906, and the institution of Old Age Pensions in 1908 would alone suffice to raise the cost of production, and coupled with this the new taxes on land and buildings has tended to increase rents and the cost of house property. The working classes call for remedial legislation, but fail to recognise the cost and its inevitable final incidence upon themselves. Take the Insurance Act. It is assumed by its advocates that for a contribution of fourpence the workman will obtain a handsome *quid pro quo*, represented not only by the contributions of the employers and the State, but by greater security and comfort. The employers' and the State's contributions cannot however be provided out of nothing, and a rise of the price of commodities will ensue. Put the whole of the contributions on the employers and the rise will be greater; increase wages, and again prices must rise. Thus at the moment all parties in the State argue and act in a vicious circle. Legislative interference with wages is suggested as a panacea without consideration of the very causes which render increased wages necessary. Old Age Pensions—13,000,000*l.*—have to be contributed to by persons who are not old, and in the same way unemployment insurance will have to be paid for by persons who are engaged in trades to which this part of the Act is not applicable. Place the whole contribution of 7d. or 1s. on the employer, yet the consumer of the commodities he produces will in the end bear it.

We are eating our cake and grumbling because we cannot keep it. We do not deny the necessity for cake, but we do desire to point out that it has to be paid for, and that no legislation can be devised which will in the end relieve the nation as a whole from paying for the luxuries which it is the custom nowadays to demand and to grant.

THE ARCHITECTURAL SOCIETIES OF FRANCE:

II.—LA SOCIÉTÉ DES ARCHITECTES DIPLÔMÉ PAR LE GOUVERNEMENT.

LA SOCIÉTÉ DES ARCHITECTES Diplômés par le Gouvernement is a comparatively young society, but it is one of growing power in France. The title is an asset in itself, and carries weight with public authorities, as well as with private persons, as all such labels do. We need scarcely say that the diploma is not obligatory, and that it in no way corresponds to the title that would operate under an Act of Registration such as it is sought to establish in England. The diploma is a scholarly degree granted to the students who have undergone successfully a certain course of study—that is to say, the training of the École Nationale des Beaux-Arts. And it is also granted to those who have won the Grand Prix de Rome in Architecture. It guarantees, therefore, a thorough architectural training. The course of study in architecture at the Beaux-Arts is generally accepted as a model of the highest standard. Architectural education in America has almost wholly fallen under its influence. In England there have been tentative attempts to establish its programme, which have not been without useful effect. In Germany and Austria, on the other hand, the Beaux-Arts system has fallen a little into disrepute; even the older men, who were trained more or less under its influence, have practically united forces with the more modern secessionist in the rejection of its teaching. In France itself there are indications that other educational influences are also beginning to count. The qualifying degree of the Société des Architectes Diplômés is sought for the distinction which education at a University (for it amounts to that) with a tradition confers; it is also sought for other reasons. The trammels of bureaucratic centralisation which the first Napoleon established in France, with its manifold ramifications, created (it is one of the most curious facts in history) out of the descendants of the *fauves* of the Revolution a subservient and docile class who are known in France as *fonctionnaires*. The diploma is useful to the man of that class. It makes him a more likely candidate for many useful positions under the State or the various municipalities. A Beaux-Arts man is, notwithstanding, always a Beaux-Arts man; the spirit of the ideal *fonctionnaire* can scarcely evolve out of so liberal an artistic system.

The history of the struggle by French architects for a diploma is both instructive and interesting, and goes back much further than the foundation of the society of which we are speaking. The agitation first began to make itself manifest in 1840, when it was sought to establish an obligatory diploma. The conditions of architectural practice had begun to change after the Revolution. Previous to that cataclysm the architect, under conditions that were much less complex than those which developed subsequently, was his own builder or contractor (*entrepreneur*). With the growth of science, the enactment of complicated building laws, and so on, his duties became so various that it was necessary to devolve some part of them on other shoulders. However this may be, the builder or contractor came into being as an independent person—a new fact in the French building world. The consequence of his advent was that the client, instead of being able to place himself unreservedly in the hands of an architect, as was the case formerly, had also to place himself more or less in the hands of the builder. M. Bonnier, in an address which he delivered before the International Congress of Architects in 1897, suggested that the interests of the builder and the client are necessarily inimical. We do not quite believe that. For, as a general proposition, it is not to the interest of either architect or contractor to perform work which does not give satisfaction. It is not a general question of honesty or competence that is involved in either case. In France it was a question of the division of parts, which had hitherto been integral, of architectural practice. But—and this the French architects of the forties found to be the danger—the new state of things opened the way to men who were wholly competent neither as architects nor business men. It opened particularly the way to a type of man who was successful in persuading the public that the so-called artistic architect was so engrossed by immaterial and abstract views of his art that the details of construction and the interests of his client had become to him matters of small importance. That was the danger which the French architects of the forties sought to mitigate by an obligatory diploma, by a sort of Act of Registration. And it is curious to note that the agitation for the diploma was begun by members of the Société Centrale des Architectes, that it was carried on for many years, and that in the end, notwithstanding the meetings and discussions of an almost interminable series of "Commissions" appointed for the purpose, a solution of precisely what qualifications an obligatory diploma should exact has not yet been solved by the most important corporate body of architects in France.

Many members of the Société des Architectes Diplômés are also members of the Société Centrale; the two societies are in no appreciable way antagonistic, while in certain matters of general interest to architects, such as the regulations of the conditions for competitions and so on, they exercise common action. The older society, however, does not altogether recognise the Government diploma as a sufficient test of architectural competence. It says, or at any rate some of its members say, in effect, "How are you to gauge the abilities of a man in an art and profession so complex as architecture merely from his achievement in school studies?"

That is to say, while admitting the disadvantages of the open door, which exists in architectural practice, the Société Centrale considers that the closed door would still leave a choice between two principles, neither of which would work satisfactorily in the higher interests of architecture. So the door remains open in France—but not, however, to the membership of either of the societies of which we have been speaking. Here both doors are strictly guarded. In the case of the older society admission is only granted to men of proved architectural competence, whatever may have been their system of training; and in the case of the younger society it is only granted to those who have won their spurs in practical scholarship.

De Musset once wrote a charming comedy bearing the title of the French proverb:—"*Il faut que la porte soit ouverte ou fermée.*" But in France, as in the United Kingdom, the door for those who wish to practise architecture is neither open nor closed. In each country, however, a *via media* has been found. In France it is the Société Centrale, in Great Britain the Royal Institute of British Architects. The doors of both institutions are only opened after an examination of the credentials of those who desire to enter. The Royal Institute has discovered a more logical method of establishing the standard of the credentials than its French sister, a standard which solves, in its system of examination and in its distinction of grades, difficulties which neither of the French societies has solved quite satisfactorily. In formulating a scheme of Registration the British society is tackling a question which many years of organised thoughtful effort in France in the middle of the last century has still left unanswered. The diploma of the Government does not provide a sufficient answer. It is too limited and too exclusive. It is in principle wholly antagonistic to any all-embracing Act of Registration. For the purposes of comparison we may ask what would the general body of practising architects in this country say to the British Government granting its imprimatur and, to some extent, special privileges to the students who had passed successfully through the schools of the Architectural Association? But the Architectural Association does not occupy the same position in national estimation as l'École Nationale et Spéciale des Beaux-Arts, and it would be absurd not to recognise that the diploma in France is becoming a greater asset to the man in architectural practice, and that the corporate body is rapidly extending its influence.

NEW PROFESSOR OF FINE ART, CAMBRIDGE.

Mr. E. S. Prior, F.S.A., F.R.I.B.A., has been elected Slade Professor of Fine Art in succession to Dr. Waldstein, resigned. The new Professor was born in 1852, and was educated at Harrow and Caius. He was a pupil of Mr. Norman Shaw, R.A., and has been architect to Cambridge University, where he designed the building in which the present Medical School is housed, to Harrow School, and to Winchester College, and has built churches and houses in many parts of England. Mr. Prior was one of the founders of the Art-Workers' Guild, and has been Secretary of the Arts and Crafts (London) Exhibition Society since 1902. His publications include "A History of Gothic Art in England."

NOTES.

Site for London University.

THE proposal to acquire the vacant land on either side of the new avenue leading from the British Museum extensions to Torrington-square as a site for London University buildings seems, from many points of view, to be excellent. It is central and easy of access, and its contiguity to the British Museum is a point in its favour. The space available is said to have an area of some 2½ acres, and, although this does not permit of any very spacious architectural lay-out, something can perhaps be made of it if it is suitable in form. The mention of four distinct plots suggests that there may be some difficulty in this respect, but, no doubt, the University will take the best architectural advice obtainable before finally selecting it. We gather that this site is suggested not so much because it is considered to be the one ideal position, but because it happens to be vacant and, in some respects, suitable. The difficulty of finding other available land in the centre of London must necessarily influence the decision of the University; but, all the same, it will be a pity if they are content with anything but the best. The erection of a public monumental building as the centre of the culture and educational life of London is an artistic undertaking of the first importance, and the first necessity is a fine and unrestricted site in the right position. This illustrates once more the pressing need for a general scheme for London to which such a monument as this would be properly related.

Further Improvements for the Marble Arch.

ALTHOUGH most architects will probably agree that it is time that piecemeal tinkering with our streets and open spaces should come to an end, they would no doubt be sorry if any such expression of opinion damped the enthusiasm of those with more zeal than technical knowledge. After all, nothing can be done unless private citizens take an interest in their city. Their desire for improvement supplies the motive power, the driving force which, guided by expert knowledge, should achieve success. The tragedy comes in when it is misdirected, when an idea which in competent hands might have produced good results is mishandled by an incompetent authority. The deplorable result of the Marble Arch improvement may well have so disheartened all those best qualified to judge that they despair of any further attempt to deal with it in detail until it can be handled broadly as part of some general comprehensive scheme.

Victoria and Albert Museum.

THE Victoria and Albert Museum has recently acquired a considerable number of drawings and designs by Alfred Stevens from the collections made by two of his pupils, James Gamble and Reuben Townroe, both of whom died in the early part of 1911. These have now been mounted and labelled; and a selection has been placed on exhibition in Room 75, advantage being taken of the opportunity to rearrange the drawings by Stevens already shown there, which are now grouped according to subject throughout the gallery. Designs for the decoration of St. Paul's Cathedral form one of the most important sections of the exhibition, the various studies in red or black, chalk or pencil, being illustrated by tracings made by Townroe and Stannus of the completed designs. The designs and studies for the decoration of Deysbrook have also been brought together, and are now supplemented with several full-sized working drawings of details in colour, which have not before been exhibited. One of the most interesting of the new acquisitions in this class of work is a sketch in water-colour for the decoration of a staircase and landing of a public building. The collection also includes studies in black chalk for the decorations of Dorchester House, and designs for silversmith's work, candlesticks, street-lamps, pottery and stoves, as well as a large number of slight sketches of architecture and furniture and memoranda of subjects for figure compositions. The Museum now possesses upwards of 500 drawings and studies by Stevens; those not exhibited in Room 75 (or Room 48, where a series related to the Wellington Monument has been hung) being obtainable on application in the Students' Room (71) of the Department of Engraving, Illustration, and Design.

The Society of Twelve.

THE Society of Twelve has increased its numbers by one-half, and yet certainly not more than the Apostolic number exhibits at its seventh annual exhibition at Messrs. Colnaghi and Obach's galleries in Bond-street. The note of distinction of the Society of Twelve is a thing apart. It is, for instance, extremely modern; its work is of the intellectual and theoristic kind, yet the show contains no suggestion of Post-Impressionism; it contains, in fact, no work which has not a sort of traditional justification. The Society is, in a word, academic without being formalistic. The late M. Legros was the Society's only honorary member. And the work of that distinguished artist, which was always so true to the simplicity of his fine temperament, which never, we think, discovered a standard below its highest attainment, expresses in a measure the aim which gives unity of effect to the 117 etchings, pen and pencil drawings, etc., which comprise the exhibition. In the choice of subject architecture is not left out of account. The drawings of Mr. M. Bone are familiar to all architects, though they have been mainly concerned hitherto with scaffoldings and shoring and building in the making. Mr. Francis Dodd and Mr. Ian Strang are definitely interested in architectural forms. Mr. Gordon Craig, so far as his view of architecture is concerned, is either purely inventive or prehistoric. We rarely visit the theatre in England, where so much accuracy in matters of scenic detail is attempted, without feeling the possibilities for composition which would be a joy to the young architect of promise. Could he not give us all that Mr. Gordon Craig gives us and more?

C

Bridges.

EVERYONE attending the last meeting of the Architectural Association acquainted with the literary work of Mr. Paul Waterhouse probably expected to hear an admirable lecture from him on "Bridges" on the occasion of the combined meeting of the Association and the Junior Institution of Engineers, but few of his hearers could have been prepared for such a lecture as he delivered—such a happy combination of wit and sound sense, presented in a novel form and with so much literary grace and effectiveness. And the occasion was made additionally interesting from the fact that the lecturer showed various drawings and sketches by his father, the late Mr. Alfred Waterhouse, R.A.—sketches which show the work of an artist of much skill and poetical feeling. In many ways the subject of bridges is a fascinating one. The accomplished result of a bridge, the triumph of man over nature, is always something of a miracle; and when such structures are suitably designed, and in harmony with their surroundings, it is small wonder that they are a source of admiration to all who care for objects that are beautiful as well as useful.

COLLEGIATE ARCHITECTURE.

AN ordinary general meeting of the Royal Institute of British Architects was held on Monday, at No. 9, Conduit-street, W. Mr. Leonard Stokes, President, in the chair.

Deceased Members.

Mr. H. T. Hare, Hon. Secretary, announced the decease of Mr. Alexander Graham, F.S.A., formerly Hon. Secretary of the Institute. Mr. Graham was elected a Fellow in 1879, and he had taken an active part in the affairs of the Institute, having served on the Council, acted as Hon. Secretary for ten years, and Vice-President four years. He was for several years a member of the Board of Examiners, and also of the Literature Standing Committee, of which he was some time Chairman. He was a frequent contributor to the *Transactions* in the early years of his connexion with the Institute. Mr. Hare moved that the Institute should record its profound regret at the loss of their esteemed colleague and that a letter of condolence and sympathy be sent to the relatives. He also read a letter from Sir William Emerson. In the course of his letter Sir William said :—

"A steadfast supporter of the Institute, he was from the first one of the most active and zealous of its workers. During my term of office as Member of Council, as Hon. Secretary, and afterwards as President, I had frequent opportunities of observing the high-mindedness and disinterestedness he displayed in all that he did for the Institute. A man of the strictest probity and integrity, he placed the honour of the profession and the well-being of the Institute before everything: to preserve the one and secure the other he would count no personal sacrifice too great.

His courtesy and urbanity of manners were familiar to us all; no one could discharge with greater distinction the various public and social functions that fall to the lot of the Honorary Secretary of the Institute. He was true and sincere in his friendships, ever sympathetic and warm-hearted, and one of the cheeriest and most agreeable of companions. I know personally that not a few young architects have cause to be grateful to him for his kindly advice and assistance."

The motion was agreed to in silence, all the members standing in their places while the President put the motion.

Mr. Hare then mentioned the decease of Mr. T. M. Rickman, F.S.A., a member of the Institute for nearly fifty-eight years. Elected an Associate in 1854, he represented the Associates on the Council of the Institute from 1887 to 1896.

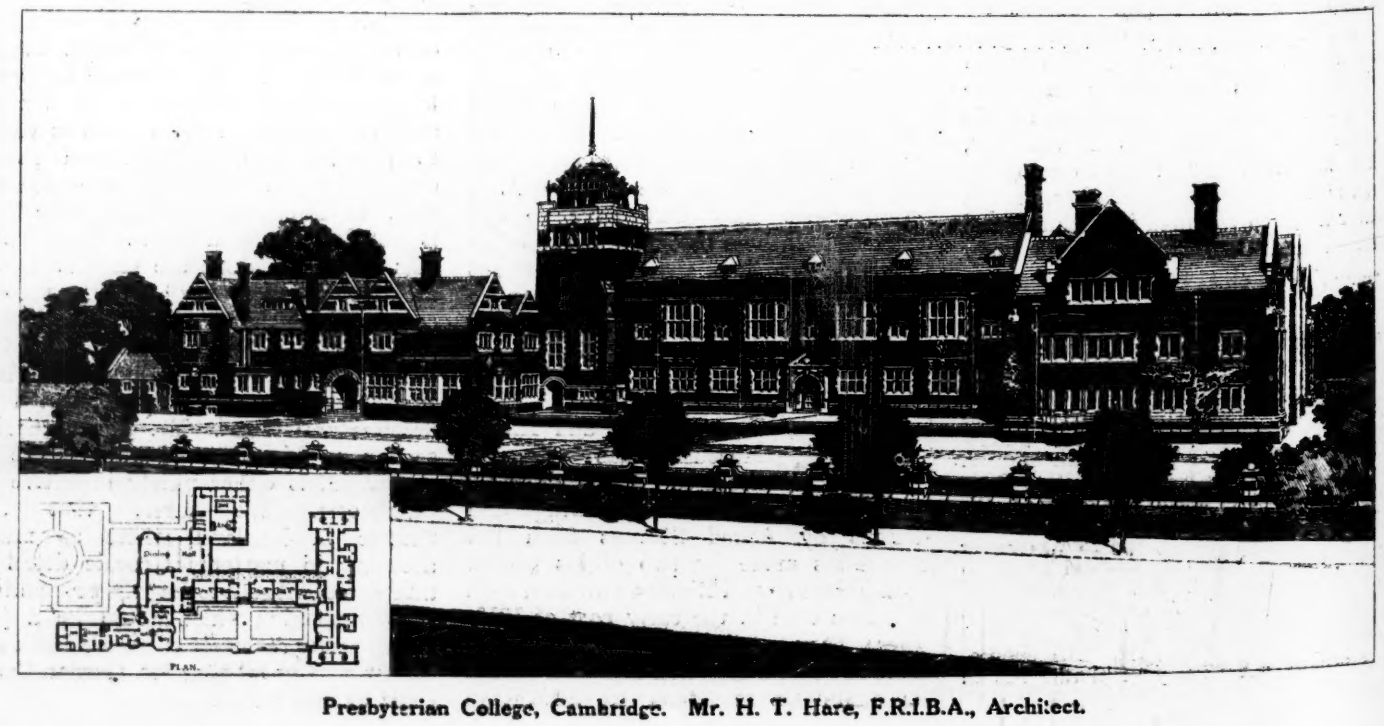
A motion recording the regrets of the members was passed, and it was agreed to send a letter of condolence to the relatives of the deceased.

Mr. Hare also mentioned the decease of Mr. Charles Smith, of Reading, another member of nearly fifty-eight years' standing: and Mr. W. King Lucas, elected an Associate in 1881.

Mr. Edward Warren, F.S.A., then read a paper on "Collegiate Architecture." Having dealt at some length with early and later Collegiate buildings, the author made some personal observations in speaking of residential colleges. In the course of his remarks he said :—

"If you adopt the quadrangular plan, and I think that you cannot, generally speaking, do better on all accounts, you will be wise, unless the ground and other circumstances permit of large courts with low surrounding buildings, to remember the open front to the south, or else to have open corners which can be bridged by arches, to admit of air currents. Such open corners can be easily and effectively managed if you adopt the cloister ground plans with arcade or colonnade, and this in itself is a practical and architecturally admirable arrangement. Or you can perhaps find useful suggestions in the double screened or pierced ground story of Peterhouse. I am assuming that you adhere to the healthy and invigorating system of passageways open to the air.

As the plan of repeated staircases, with their dependent groups of rooms on each successive floor, still finds, and is likely still to find, favour in colleges it may be well for a moment to consider some of its possibilities, and, to that end, I show you a plan of Brasenose College, in which you will see the arrangement of the old chambers, and Mr. T. G. Jackson's disposition of the new. But if you arcade your ground floor you must of course narrow the depth on that floor available for rooms, and will probably find that lecture-rooms, bursaries, single rooms for non-resident tutors, or single sets can best be placed there. Mr. Lock has pointed out that the arrangement of two sets in depth with the dividing wall has two disadvantages—(1) you lose the opportunity of free air passage, or perflation, so easily obtainable if you have single sets of sitting or "keeping" room and bedroom, in the depth, by means of the usual communicating doors; (2) both bed and sitting rooms must have the same aspect. There is a further disadvantage, which is that as your span increases your roof is apt to grow higher, and it is generally desirable to keep it down. If bathrooms are supplied and with a sufficient number of baths the bedrooms can be very small, say, about 100 sq. ft., or even slightly less; but, of course, a comfortable bed space not facing the light should be provided. Bathrooms are very generally placed in the basement, and this where the ground floor is raised a little, so that window heads can be brought slightly above ground, does very well, provided that the necessary areas for light and ventilation can be outside the quadrangle, *i.e.*, at the back of the ranges, and wide enough, and that smaller areas or fresh air inlets are provided in the quad, so as to give a cross current. The baths are generally arranged in cubicles some 7 ft. by 5 ft., with partitions 6 ft. high or thereabouts, and raised well off the floors, in the ratio of a bath to four or five men, and about half the number of shower baths. A service-room for keeping and drying towels, and a general dressing-room or two, for muddy youths fresh from "Rugger or "Soccer," is most



Presbyterian College, Cambridge. Mr. H. T. Hare, F.R.I.B.A., Architect.

advisable, with a supply of lockers for flannels, etc. If you have a bathroom and consequent bath boiler somewhere in the basement a hot water supply to each pantry can be arranged. The Fellows' rooms are usually now in sets of three, a large sitting or tutorial room, a smaller sitting-room and a bedroom, and should have an "oak." College bursaries are merely offices for college business, and should be conveniently placed near the entrance. There must be at least two good well-lit rooms, the bursars' and bursary clerks', and a strong-room and lavatory. Frequently more rooms are needed, a senior and a junior bursars' rooms, and a college office or meeting-room.

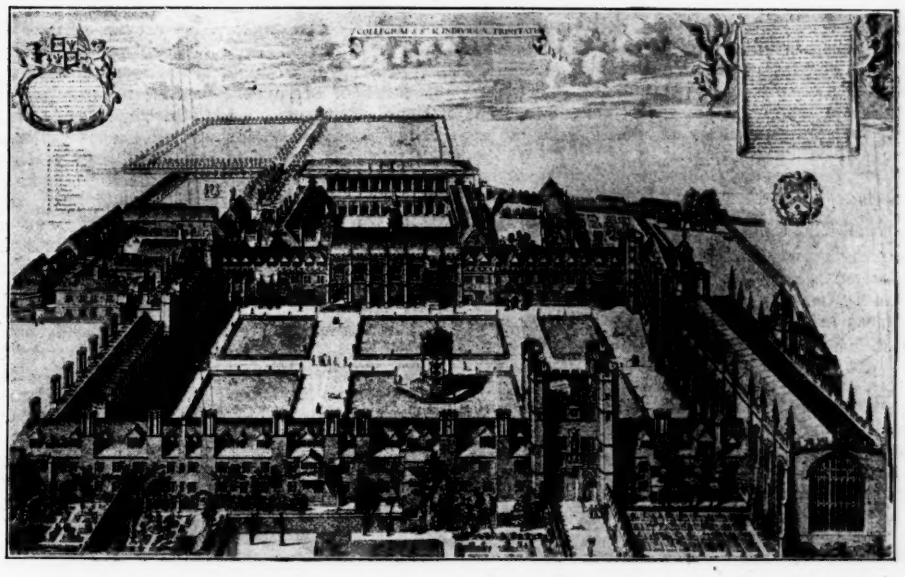
The master's dwelling has grown from the few rooms formerly allotted to celibate masters, and are now complete domestic dwellings for married men, much like a good rectory house in requirements, but with one special need, a really large study or library, with an ante-room leading to it. The dining-room should also be a large room.

The common-room has expanded from the ancient parlour or solar into a group of rooms constituting the Fellows' private club, and having a large and comfortable sitting-room, where desert, wine, and coffee are taken after dinner in hall, and where luncheons are generally served. Attached to, or near, this is the now invariable smoking-room, and it is not infrequent to have a third and smaller room for writing, etc. The junior common-room is the undergraduates' club, and usually consists of one large room, where breakfast, and frequently luncheon also, is served. It is useful to provide a second room for reading, writing, etc., and for both senior and junior common-room groups a distinct lavatory is advisable. There is a new refinement of the common-room group which I have just been called upon to supply at Oxford—that is a common-room dining-room, with an ante or drawing room leading to it, and a cloakroom and lavatory.

Residential colleges for women are multiplying and extending and growing in architectural importance and beauty. These naturally require somewhat different arrangements, the general system being more domestic, and open-air passages and basement bathrooms, etc., being usually avoided. Large bed-sitting-rooms usually take the place of the masculine double set, but parlours and music and recreation-rooms are provided. Otherwise the recognised collegiate requirements apply, the chapel, hall, and library being just as essential, or even more so, than for the other sex. Bursaries, perhaps, are not so formal, and common-rooms have a rather different character, being, for one thing, connected more with tea than the grape.

Chapels.

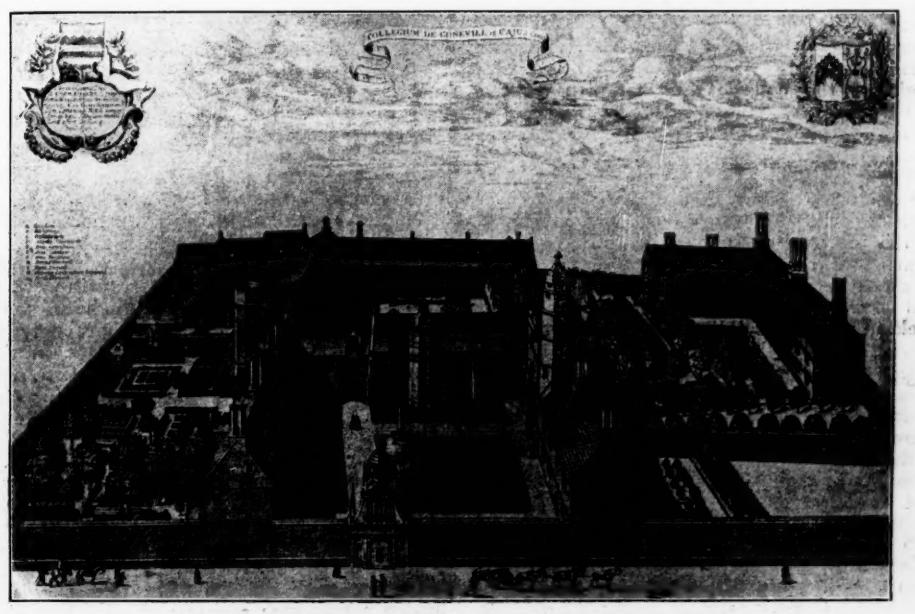
The chapel of a college is traditionally a chancel, screened off from the ante-chapel to which the non-collegiate are admitted, and is the survival of the monastic choir screened from the secular nave. In obedience to this tradition the seats are arranged as stalls, looking inwards instead of eastward as in secular churches. Return stalls are allotted to the master or president and his more immediate satellites. The seats are arranged in tiers rising from the gangway, the Fellows occupying the upper and more dignified rows, the undergraduates the inner and lower. Thus to take a bench seat in a college chapel is to increase and not to diminish one's dignity. This arrangement seems so suitable as to need no adornment in modern times. There is usually no pulpit, as sermons are only occasional and commendably short, and delivered from the lectern. As is common in all collegiate churches in England, cathedral or other, the organ and choir gallery are very usually placed on top of the screen, an admirable arrangement both musically and practically. A college chapel is of greater height than adjacent ranges of the building, and, placed axially more or less east and west, should, if on the side of a quadrangle, be always on the north side, so as not to cast its shadows where shadow is detrimental. The same observation applies to the hall if lofty and if similarly placed. The chapel is the better without any east window as a rule, and chapel and hall alike are the better for uninterrupted ranges of side windows, which are best kept high, in the first case on account of the stalls and their panelled backs, in the second to avoid a low light in the diners' faces, and to provide the opportunity of a high wainscoting, which is incidentally an admirable background for college portraits. The screen, of course, is a mediæval survival immemorial in refectories and dining-halls. It has survived because of its obvious utility. It shuts off from the hall the draughts of constantly opened doors, the scurry of servants, and all the traffic between buttery or pantry and kitchen. It is as useful now in all these respects as heretofore, and it has an added function in screening the modern appurtenances of service lifts, hot tables, switchboards, and call tubes, and all the constantly growing paraphernalia which science provides for the furtherance of material ends. Its ancient form still subserves modern usages, or, perhaps, more correctly speaking, has begotten them, in the happy fact that its roof provides a gallery, anciently intended for musicians, and still sometimes devoted to music. It is very useful, during the crowded festivities of college balls, as a retired post of vantage for observant chaperons, or a resting-place for the breathless energetic. It has many utilities, and should on no account be omitted. The college dining-hall is the great social centre and the common meeting-place of the college. It has to serve for examinations and special assemblages of various sorts. It needs careful lighting at night, as by day, and careful warming and ventilating. Low or high-pressure hot-water systems, fresh-air inlets, and the electric fan provide admirably for these requirements. It is generally wise to give it a good dancing-floor of oak boards. The hall may be, as old halls frequently were, placed over the kitchen, buttery, etc., but should be so disconnected that kitchen smells do not penetrate it.



Trinity College, Cambridge.
(From Loggan's "Cantabrigia Illustrata.")

Libraries.

The recognised collegiate plan for libraries is not only picturesque—*i.e.*, architecturally effective—but practical; the double bookcases standing at right angles to the walls give increased book space, and at the same time divide the room into secluded bays where students can sit at a table and work in comparative isolation. The bays should be not much less than 9 ft. between the bookcases, and will be better from 10 ft. to 12 ft. wide where tables are to be inserted; and this arrangement implies a window to each bay. The lighting of libraries is important; north and east are the best main lights, but if a long library is lit from its north and south or east and west sides blinds or curtains will be needed on the south or west sides. Quietude of effect internally is essential, and a scholastic gravity of exterior seems appropriate, but there is no need externally or internally for the gloom and ponderosity so often bestowed upon libraries. In planning a non-residential college, say the modern university college of a large town, and intended, of course, for both sexes, the problem becomes very different. The chapel is usually not required, the hall subserves different purposes, and is usually more or less of a speech hall; lecture-rooms, lecture theatres, and classrooms, scientific laboratories and workshops are needed, and, not infrequently, some sort of museum is added, and a gymnasium is not unheard of. Colleges, residential and non-residential, have been devised and built in recent years in considerable numbers, and it is interesting to



Gonville and Caius College, Cambridge.
(From Loggan's "Cantabrigia Illustrata.")

observe in what manner the collegiate sense has been accepted or interpreted by those to whom it has fallen in recent years, either at Oxford or Cambridge, in immediate contact with these ancient things, or elsewhere free from such propinquity, to build colleges or schools of collegiate type."

Mr. Basil Champneys,
in moving a vote of thanks to the lecturer, said a question which had been constantly before his mind was, how the standing arrangement of staircases in college buildings came about. To him it was a great puzzle. The only theory which he thought met the case was this. Mr. Warren showed the old buildings of Worcester College, Oxford, where there are a number of small buildings, each with a difference of assignment and each with a different staircase and its rooms. And these form a kind of conglomerate. Worcester was too late a precedent for New College, or even for Merton, but it was known that in the earlier Oxford there were a multiplicity of halls. Was it possible there might have been in Oxford some sort of conglomerate halls like that of Worcester, of earlier date, which might have suggested the plan of separate staircases, such as was adopted, as far as one could tell, by William of Merton, and certainly by William of Wykeham, at a later date? However it originated, there was no doubt the staircase arrangement, as used by William of Wykeham, had held its own, and, though the purposes of the rooms have been converted, it seemed to him the best arrangement on which colleges could be planned for the present day.

Professor Simpson
seconded the vote of thanks, and in doing so said he regretted that the lecturer had not referred to the big modern laboratory buildings for scientific research which must now form a part of every University. Those buildings required an entirely different treatment from the old buildings. In modern buildings large windows, lofty rooms, and the walling reduced to a minimum were absolute necessities.

The Rev. T. B. Lock (Bursar of Gonville and Caius College, Cambridge)
said as to Mr. Champneys' question, how the colleges took their present shape, last summer he studied Haddon Hall, which was almost an exact replica of an Oxford or Cambridge college; there was the hall, the kitchen, the chapel, the combination room, and in addition the long gallery. That was common to all colleges. Queens' College, Cambridge, was almost a replica of Haddon Hall. The arrangement was not quite the same, but there were two courts, and you pass from one court to the other through screens—that is to say, the gallery and the hall. The gallery itself is in exactly the same position in Haddon Hall as the gallery in Queens'. The chapel is in the same position, and the only difference is that the kitchen is on the south side of the court, and is approached not through the screen, but they had to cross the court to get to the hall. With that before us we cannot have any doubt as to the origin of the collegiate form which we see so frequently repeated. The dwellings were separate houses ranged around the quadrangle, we might call them staircases, just as they are at Oxford and Cambridge. As an instance of the advantage of having one side of a quadrangle open, it occurred to him that he might mention in the presence of Mr. Jackson his ingenious solution of that difficulty. When the court in which the Geological Museum, Law Library, and new Archæological Museum which Mr. Jackson was now building were being arranged, it was wished to keep an opening on one side of this long court. Mr. Jackson suggested they should put the library on top of open arches. That seemed at once to solve the question; there was fresh air coming in through the middle of the space, and on the top of it was a beautiful library, devoted to Law, which Mr. Jackson had built.

Mr. T. G. Jackson
referred to the growth of the college plan such as was found at Oxford and Cambridge, and said that they grew up insensibly without any definite motive at first. These college buildings grew up in a sort of accidental way, and the Universities existed for a long time without colleges at all—young men being lodged in halls. There were private houses of the ordinary domestic type, and with two or three of them thrown together we got the origin of the Oxford staircase, and when colleges came to be founded they were made up of half a dozen halls thrown together.

Mr. Aymer Valance showed some additional slides, and also remarked that colleges were built up of pre-existing halls, and that explained how the central staircase came in; it represented a separate cell. The buildings were built up and added to just as they were required.

The Chairman then put the vote of thanks to the meeting, and it was heartily agreed to.

Mr. Warren, in reply said that New College appeared to have been a deliberately planned college, and was not built up by bits, as was the case in other colleges.

The Chairman announced that the next meeting will be held on March 4—a business meeting: Election of the Royal Gold Medallist.

The meeting then terminated.

BRIDGES.

THE following is the second part of the paper which Mr. Paul Waterhouse, M.A., read last week before the combined meeting of the Architectural Association and the Junior Institution of Engineers, together with some notes of the discussion which followed. The sketches which Mr. Waterhouse showed, some of which were reproduced as slides, were the work of the late Alfred Waterhouse, R.A. Other slides were from the photographic collection of the Architectural Association:—

"If the Devil built the Roman bridges, who built Napoleon's? What do you think of this one from the French side of the Pyrenees? Whether it is a true product of Napoleon I do not know, but it is an absolute poem on all that the word 'Napoleon' means. That leap so rash and yet so assured, that exact fitting of available means to an end, and, to crown it all, that trim bit of Roman assumption in the parapet. Add to this the position in Nature, the rugged, lonely, and defiant spot upon which the hand of resistless man has been laid with infinite delicacy, yet infinite pertinacity, and you have here a sonnet or an essay clearer than any in mere words."

"Surely," said Harper, interrupting, "you are beginning to fly rather high in your rhapsodies! The simple fact probably is that the bridge in question presents, in the absence of steel or chain construction, the most obvious and practical device for the purpose. It is really difficult to understand what simpler expedient Napoleon (or the Devil, for that matter) could have adopted."

I ventured to cut in with the suggestion that, after all, the span—as I happened to know—was 150 ft., and that, whether we looked upon the structure as poetry or prose, devilish or Divine, it certainly needed a bold mind to entertain the idea of flinging a bridge across such a chasm at all. Humbler men in a less enterprising civilisation would have been content to master the difficulty by taking a circuitous route.

Bridges and Sentiment.

Said Pargiter: "If you are a man of sensibility at all—in the good Jane Austen significance of that word—you can't look upon bridges in any but a sentimental light. Bridges are full of sentiment, steeped in it, and unless you are accustomed to go through the whole of life seeing nothing but facts and figures, you are compelled to receive something of the message which almost every bridge bears."

"Charing Cross Bridge, for example," said Harper, "and that which exudes from Cannon-street Station like a slug from its loathsome lair!"

"There," said Pargiter, "you rather have me. Let us wipe out the thought of poor old Thames by the refreshment of a glance at Florence—Florence from San Miniato, one of the fairest prospects in the whole world, and a prospect of which the bridges are the fairest part. Look at them as they glide one after another, marking by their perfect radiation the noble curve of the noble river, each true to its trust, economising its material, and springing from pier to pier with as little waste of stone as will suffice to bear in safety from shore to shore the gaiety, the commerce, the beauty, and the strength of the city that was worthy to be Dante's and Alberti's home. Ponte Vecchio, the old bridge, and the farthest, breaks, you think, the rule of economy. But no; it only shows its mastery by one of those delightful thefts from the river of which we should have an example in London if only old London Bridge were still spared to us. The Ponte Vecchio is like a traveller who, wayfaring through difficult country, traffics as he goes. Its parapets are lined with shops, and many are the English pounds that have been lured over its enticing counters.

Durham, Conway, and Monmouth.

It is hardly fair (he went on) to compare London with Florence, for if there is one thing more than another that bridges express it is nationality; so let us set up for a minute this sketch of Durham. See the rugged British force of the whole composition. The bridge belongs to the Cathedral. Its slope emphasises the height of the crag on which the Cathedral stands, and its irregularity—lack of uniformity between one arch and another—adds immensely to the rough vigour of the scene. A suspension bridge can be, and often is, a lovely thing, but imagine, if you can, a suspension bridge taking the place of Durham's rude causeway, and you will realise that it would spoil the picture absolutely."

I instanced the suspension bridge at Conway as an example of the discord to which Pargiter referred, but he was not wholly willing to agree, declaring, with delightful inconsistency, that the lightness and modern grace of the steel-rope structure gave force and mass to the Castle, and was consequently of pictorial value.

"Your mention of Wales," he added, "reminds me of Monmouth and its truly excellent bridge. The first time that I saw it—quite unprepared—it gave me a shock. I could not believe that I was in Britain. The bare idea of a bridge having anything on it in the way of a bridge house, or a chapel, or other structure, is so entirely foreign to our island's methods. England is fearfully parsimonious in the matter of little excesses of this kind, so that one's first involuntary cry on seeing such a development is, 'How did they afford it?' Compare this with a Nuremberg example, and you will hardly guess which is the English and which the German.

There is great charm about a bridge with something on it—of course, as an alternative to the bridge which is a bridge alone. That is one reason for our bitter regret at the loss of old London Bridge. That and Florence's Ponte Vecchio, and in a different degree Venice's Rialto Bridge, are instances of the instinct to make good financial use of the space which the bridge has won from the water, a picturesque act of commercialism which might well be repeated in modern times.

Why we habitually shrink from the chance of making a bridge pay rent for its existence by a row of shops is more than I, for one, can understand.

Buildings on Bridges.

Of bridges with things on them there are several kinds. There is the covered bridge, of which there are two at Lucerne; there is the bridge with a chapel, of which even England has one or two examples; there is the noble bridge at Pavia with both roof and chapel. Then there is the festive Roman idea of a bridge with one or two triumphal arches. We saw the rudiment of this in the Puente del Diablo; a better example is the bridge at St. Chamas, of which I have found an old engraving. Even you, Harper, must allow that such a bridge is sentimental, for a triumphal arch has no meaning whatever but a sentimental meaning. It is a costly expression of pride."

"I am not quite so sure of that," said Harper, "for you will probably find that a good many so-called triumphal arches are in reality merely glorified versions of toll-bars or customs-barriers, and those placed upon a bridge may very probably have served both purposes. But I see you have there a photograph of the Palladian Bridge at Prior Park, Bath, which, like that at Wilton, I frankly admit to be a mere piece of building for effect. In fact, it is a garden ornament, to be classed with statues, urns, and fountains among those products of masonic and sculptural art which by their presentation of ornament without use are thereby removed from architecture according to my definitions of that art."

"You are on very dangerous ground," said Pargiter (for if you talk of ornament without use you imply that there is no use for ornament), "but if we enter that ground now I fear we shall never get through our portfolio and its enjoyment."

"Very good," said Harper. "Let us leave the dangerous ground, but before you proceed to say anything on the subject of large towns with large bridges on large rivers I want to put in a word of common-sense caution. You are off on the tack, Pargiter, of seeing something more than meets the eye in every bridge that ever was built, and before we get too far in our flights I have just a word to say.

We all know the story of the innocent person who observed that all the larger rivers of the world seemed to make a point of running through or by the largest towns. The fact, of course, is that ancient cities needed a river (if they could possibly secure a site upon one) for transport, for water supply, and for defence. Here were three great natural advantages to be had for nothing, and only one disadvantage, the need to cross the river, which need was met by the inevitable bridge.

Thus it comes about that to most mediæval cities—for most of them managed to fulfil their desire in finding a river and settling by or on it—to most mediæval cities a substantial bridge was a common utilitarian adjunct as general and as unworthy of special artistic enthusiasm as the railway-station, which is the common accompaniment of the modern city. I have here a photograph in point. It is the fairly well-known Ponte del Ammiraglio outside Palermo. I admit it is a well-built, bold, and a very ancient structure, but it would be a mistake to look upon it as one of the wonders of the architectural world, or as conveying one of those poetic messages which you, my friend, are seeking to find in every combination of piers and arches."

Pargiter looked steadily at the photograph and said:—"You have an eye like a Kodak, Harper, and I am prepared to admit that the camera which took that view missed a good deal of what there was to be seen. I am not willing to say that even that bald presentment fails to convey to me something of the spirit which is really in the bridge, but I do certainly claim that the sketch—for, oddly enough, there is in the portfolio a sketch of the same subject—sees more and says more.

Toledo and Limburg.

But while we are on this side of the subject just think of Toledo. Toledo on the map occupies a peninsula three-parts surrounded by the Tagus. A bridge or two is everything to Toledo—necessities if you will, but none the less gloriously important. To be bridge to Toledo is a proud office. Why, a King is a necessity (to some of us), and a coachman is a necessity to the Lord Mayor, but you don't think that King or coachman are the less proud for their needfulness. The bridges of Toledo know fairly well the glory of their office, and don't they just show it? Look at this one. There is no commonplace drudgery about this fellow; he certainly has his duty to perform, an everyday duty of conveyance, but he goes about it with the gaiety proper to the drummer of a cavalry regiment, and if you were to walk over him you would feel pride arching his back in every yard of his up-and-down gradient. And should you wish to know how Toledo's other bridge bears its burden of office, go and see it by moonlight as painted by Harold Speed in the Tate Gallery.

Your position, Harper, that necessitous duty knocks the sentiment out of these friends of man, is no good. Look at Limburg. Limburg doesn't say that, having settled on the River Lahn for commercial and strategic reasons, it has built a bridge as a traffic necessity. Not a bit. It says, in defiance of history and geography, Here am I, Limburg. I have chosen a fair hill-slope for my township, I have ordered a majestic crag for my cathedral, and, to make my picture perfect and to show that I am lord of my great river, as well as of my noble landscape, I have flung across a bridge—such a bridge. And what does the bridge do for the cathedral? Everything. It makes length to emphasise the cathedral's height, it makes mass to emphasise its detail, foreground to give distance, colour to catch sunshine. Where is your railway-station now?

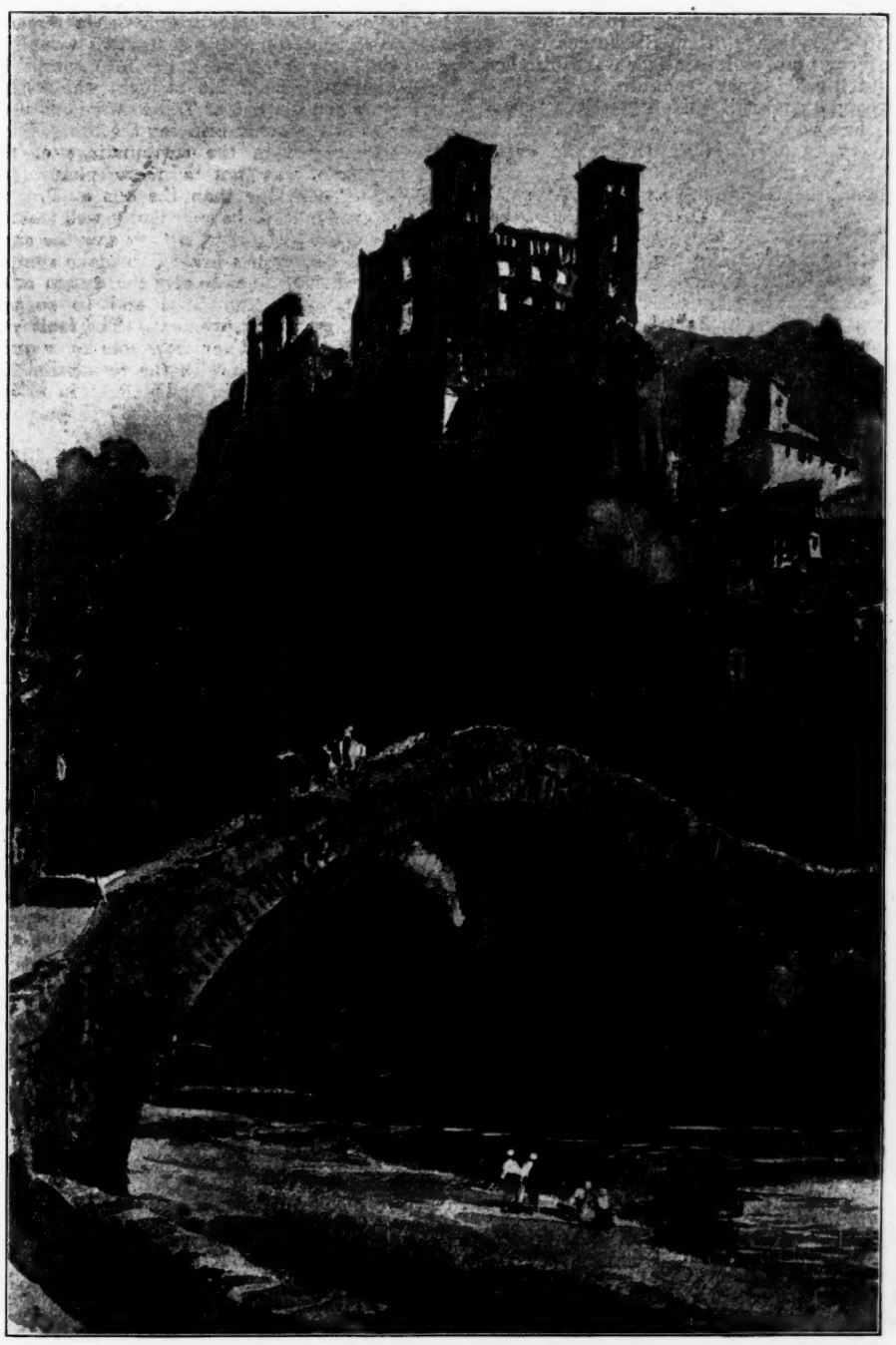
What Bridges Tell.

No; you can make nothing of your assumption that a bridge is a mere fact. Take even these two quiet English works from the River Thames. What do they tell? A whole story. British character, for one thing; for another, that, though standing in a country landscape, they are near a large and cultivated town. They tell you that the road they carry is an important one; they tell you that they belong to an age in which bridges still ranked as architecture, and their classic detail tells, what classic detail always tells, that the men who built them belong to a brotherhood wider than Europe and as old as Greece.

If you are to criticise them, it will be to say that they are not at one with their surroundings, but they are not wholly meant to be; they are the advance-guard of London coming forward to meet the traveller with a foretaste of the town and its culture.

But if you come to speak of fitness among surroundings, see how these three arches over the moat at Kentwell Hall take their place among the trees—so tenderly, so perfectly, that they almost add to the very silence of the scene!"

I asked Pargiter if there were any sketch of the bridge at Avignon. "Alas, no!" he said. "I wish there were. Such a bridge as it must have been! The lean fragment



Dolce Acqua. From a Sketch by the late Alfred Waterhouse, R.A.

(Illustrating Mr. Paul Waterhouse's Architectural Association Paper on "Bridges.")

that remains is like a greyhound—a bit of tense, almost muscular, masonry. Its very destruction seems to show how fine in its case was the margin between weight and energy.

And what have we here—the last in the portfolio? The bridge of Prague. What a change! Here is nationality with a vengeance. No English town, no French, could have expressed itself in such a guise. Look at its gallery of statues; look at its towers, at their challenging inequality, their fantastic shape! The crucifix that crowns the bridge's centre was paid for, so they say, from the fine laid upon a Jew who had reviled the Cross. There indeed was a rich riot of faith, and faith is a great thing among bridges."

This is, perhaps, hardly the place in which to tell you verbatim the things that Pargiter was led on to say as the result of this train of thought. You can perhaps guess his direction. He suggested that the kind of man who, for one reason or another, takes no heed of sacred emblems might yet find it in him to raise his hat when he came upon such a symbol in such a place as the crown of a noble bridge. A host of ideas ran through our friend's mind and found utterance. Art and skill, he said, had conquered Nature and force; but was that all? What of the old river god and the Divinity that now stood over him? Was there nothing in that thought? And even, apart from this, he said, if you don't care for Christian imagery and take no account of pagan mythology you still must have some faith in the doctrine of outward and visible signs. Those "books in the running brook, sermons in stones, and good in everything" that Shakespeare tells of are very real, and to all but the blindest very intelligible, very readable.

"Depend upon it," said Pargiter, "every bridge has had a bridge-maker, a pontifex, and every pontifex is a priest, and every priest has his message.

Nationality, character, mood, temperament, welcome, defiance, joy, gloom—all these are songs that a bridge can sing. But through them all and with them all it sings by its mere being, by its mere act, the song of the passing, the song of the river crossed, the song of the coming over, which is an overcoming. And for those that overcome there is a crown."

We two came out from Pargiter's room and said good-bye. I walked home with Harper. We didn't talk for a space. Then I said, "You rather curbed our friend once or twice, but I daresay you did well or meant well in bringing him down to earth. Anyhow, I know he never thinks the worse of you for it."

I said this because I thought he might be feeling remorseful.

His reply rather astonished me. "I don't care," he said, "what Pargiter thinks, but I am sure that in all he said to-day he was perfectly right."

Mr. W. T. Dunn (Chairman of the Junior Institution of Engineers),

in proposing a vote of thanks, spoke of the novel and admirable paper which Mr. Waterhouse had read. As engineers they had expected to hear something as to the design of bridges and as to materials. The lecturer had shown Mr. Waterhouse not only as a capable architect, but also as an artist and a word-painter.

Mr. H. H. Statham

seconded the vote of thanks, and said that the lecture had been essentially one on the poetry and picturesque of bridges, and they would be prepared to hear from their engineering visitors that there was another side to it. As an example of an engineering bridge which was perfectly simple but effective, there was the tubular bridge over the Menai Straits—a practical construction in which there was nothing which offended the taste. What architects felt about engineering structures was that they would like them better if there was no architecture upon them. He was a great admirer of the Forth Bridge, but if any attempt had been made to ornament that structure it would have been gimcrack. It was expressive because of its enormous size and grandeur of structure.

Mr. Percy Waldram,

in supporting the vote of thanks, said a bridge was a thing with muscles and life, and no bridge-designer could think of the creation of bridges with their huge arms and muscles spanning great spaces without a very keen sense of responsibility. As to the question between architects and engineers, it really came to this—*i.e.*, whether engineers knew enough about architecture or whether architects knew enough about engineering. There was a great deal in the point of view that as structural work truly expresses itself so it grew in beauty, and the putting together of materials in the erection of such works as bridges was not a mechanical operation only. Engineers often built ugly structures, but that was not because they were engineers, but because of their bad engineering—not because they knew too much of stresses, strains, and thrusts, but because they knew too little. As to reinforced concrete for large bridge spans, he thought it was open to serious objection, concrete being such a weak material, weaker even than wood. If the arch of a bridge followed the line of thrusts there ought to be little need for reinforcement, and if there were he thought it was generally due to bad designing. Engineering and architecture were not alien one to the other, they were the necessary complement of each other.

Mr. J. J. Burnet

said he thought such mixed events were provocative of good engineering and the best architecture. He thought that no artistic thought given to a bridge should take away the engineer's work. The first duty of a bridge was to span a river or something and do its practical work, and an architect could come in to make the design suitable to its surroundings—to give an artistic rendering to the highest mechanical realisation. The Forth Bridge was a remarkable work, but some day something would be done to bring it a little more into sympathy with the landscape. He thought the bridge at Prague and the one at Toledo were excellent examples of the artist bringing the bridge form into harmony with the surroundings of the town. There was not a more picturesque example of a bridge than the one at Prague. Architects ought to be sufficiently well trained in engineering to be able, if they saw the engineer's first sketch of a bridge, to make sympathetic suggestions so as to give the design more relation to its surroundings and to suggest alteration for its improvement. The fault was that neither engineer nor architects knew quite enough to sympathise with the responsibilities of the other. The principal delight in bridge work must be its obvious integrity of purpose, open to the understanding of everyone.

Mr. Percy Young having spoken,

Mr. A. T. Bolton

said the bridge was immensely simplified when it had a natural setting—when there was a cliff from which it could spring, giving the idea that it united in a most perfect way with its surroundings. That was one of the great features of Waterloo Bridge, and he was not acquainted with any bridge which had the same beautiful finish; and the bridge was remarkable because the architectural element was so strongly introduced—the columns, though they had no practical structural purpose, were introduced in a way which made them never seem excrescences. London Bridge had a more utilitarian and compact aspect in the way the columns were introduced. He could not help thinking that at the beginning of the XIXth century there was a much better feeling between engineers and architects then had existed since. Engineers of that day seemed more disposed to work with architects and more disposed to artistic influence. Some of the mistakes of architecture among engineers were due to the deplorable summary of architecture which used to exist in engineering handbooks, and probably they did not exist now. Engineers got a sort of idea that all they had to do was to get hold of these summary facts and apply them. He could not see what we should not have bridges lined with shops, and as far as he knew there was no real objection to it. In the erection of future bridges there should be more co-operation between architects and engineers.

Mr. Philpot having spoken

Mr. H. W. FitzSimons

said, as to reinforced concrete bridges, if a moving load were placed upon an arch, and if the arch had a very slight rise compared with the span, then provision had to be made for resistance to the tension stresses which came into the arch. No matter how the arch was shaped there must be a tendency to tensile stress. As to Conway Bridge, engineers regarded it with a little reverence as it was one of Telford's first bridges and one of the earliest structures of its kind. It had fully carried out its purpose until recently, when it had to be strengthened. The sketches they had seen were very beautiful, but think of designing such bridges nowadays! What would a Parliamentary Committee say to an engineer who proposed the small spans of some of the river bridges shown? Engineers had to provide now for as large a span as possible, as high a headway underneath, and as low a gradient as possible, and it was difficult to bring all these points into proper relation one to the other. The probability was that if engineers worked more with architects better results would be obtained, but it was a difficult question as to where one was to leave off and the other commence, and it was certainly difficult in regarding it from the financial point of view, for public bodies acknowledged one of the professions, but would not acknowledge both. Some of the Continental steel bridges were beautiful structures, and he did not think exception could be taken to them. A bridge was a structure intended to carry traffic, and under present conditions the man who must design such a work was he who had been specially trained so to do, and he did not think that architects could deny this to be the work of an engineer.

Mr. S. Bylander

said he did not think it was impossible to make a steel bridge beautiful, and he instanced the Washington Bridge with its two large arch spans, at least 500 ft. each; under one was the river, and under the other eight lines of railway. The bridge was entirely built of steel, and, to his mind, it looked beautiful. As to stress, it was interesting to look at the Brooklyn Bridge as trains crossed, and see the movement of the members due to increased stress. A bridge was more interesting than a machine—a machine had regular movement, while the stresses in a bridge varied greatly.

The Chairman,

in putting the vote of thanks to the meeting, said that such meetings led to a better understanding between the two professions. One could not help being struck by the way in which engineers approached the question. One gentleman said that Parliamentary Committees would not agree to a bridge which contained as many arches as the bridge at Limburg. Very likely not; but Parliamentary Committees would tolerate bridges expressive of the needs and the powers of design of the time. If there had been a Parliamentary Committee at Limburg they would have passed that bridge with acclamation, because it was a bridge which was thoroughly embued with the spirit of its own age. If we could learn from the past—if we could realise that the Roman bridge builders were as much artists when they were building a bridge as when they were building a basilica, perhaps we should all try to combine together—architects and engineers—to make our bridges always things of beauty. If we could come to some agreement when a bridge is being designed to make it beautiful, he thought it would be a great advantage.

The vote of thanks having been carried very heartily,

Mr. Waterhouse,

in replying, said as to the great question between architects and engineers, he felt that the craft of both of them was so very big that neither of them would ever get to the end of it. They could not be giants combining both functions in one, though the ideal solution of the question was that designers should be almighty, combining both professions; then everything would go very well! In the meantime he felt the problem was, so to speak, an insoluble one. There had been a seeming indication that he was not friendly to suspension bridges, whereas he had a great reverence for them. As to the Forth Bridge, he could only say that though it was in a sense an ugly thing, it was nevertheless one of the most wonderful things in the world. But really ugly was not the right word to use; it was a compelling thing, and he mentioned the ugliness only in order to emphasise the immense force it exercised on him and, he believed, on everyone else who looked at it wonderingly and respectfully. It filled him with amazement every time he saw it, and it threw over all his

preconceived ideas of architecture and the rules of art. It was a thing full of spirit, life, and idea.

The President announced that the next meeting would be held on February 26, at 7.30 p.m. (a combined meeting with the Camera, Sketch, and Debate Club), when a paper would be read by Mr. F. C. Eden, entitled "Hopes and Fears for Architecture."

ARCHITECTURAL SOCIETIES.

Manchester Society of Architects.

On the 14th inst. Mr. A. N. Paterson read a paper, entitled "Scottish Architecture, Ecclesiastic and Domestic, XVth to XVIIth Centuries." In tracing the history of the early development of Gothic art in Scotland he showed how till the XVth century Scotland followed in the wake of the general traditions of building in England. That then, when England had passed to the Perpendicular period of flattened arches, fan vaulting, and perpendicular windows, Scotland, severed from English influence by the war, developed an architectural character of her own. This she maintained for the two following centuries, but it was to France rather than England that she turned for friendship and inspiration. The time for the building of churches had now passed away, and Mr. Paterson showed with some excellent slides the development of the country house from the Peel tower and castle.—A vote of thanks was proposed by Professor Capper and seconded by Mr. Hewitt and heartily carried.

Birmingham Architectural Association: Modernism *v.* Authority in Architectural Design.

At a meeting of the Birmingham Architectural Association at Exchange-buildings, New-street, on the 8th inst., Mr. Howard Seth Smith delivered a lecture on "Modernism *v.* Authority in Architectural Design." He entered a protest against the tendency in certain teaching of the day to stereotype the classical ideal in architecture, which was opposed to the flexibility and versatility of mind, and then spoke of the domination in France and Italy of classic design of the last two or three centuries, remarking that traditional mediæval architecture had been completely suppressed, and that the influence of the French schools of architecture in that direction had, in his opinion, been fatal to the more domestic, educational, and ecclesiastical architecture of the country, that side of practice which must occupy the majority of professional talent. The principles on which he thought our schools of architecture should be conducted, and which corresponded with the general trend of the syllabus of the Education Board of the Royal Institute of British Architects, were, above all things, to teach the students to observe them, and invent rather than to cram and copy; that a sound general education should precede entrance to the professional schools; that the course of instruction should be progressive, commencing with elementary design and construction, and leading up to an honours or post-graduate qualification; that the intimate association of construction and design as exemplified in the history of the great architecture of the past, and inculcated by means of the school workshop and lecture-room, should be insisted on throughout, design and draughtsmanship being emphasised as essential elements of architecture; and that, while the school course must be largely general and theoretical, the office course should supply the more practical part of the training, and for encouragement should be offered to advanced students to specialise.

Sheffield Society of Architects and Surveyors: Support for Buildings.

Mr. J. H. Cockburn, of Rotherham, by special request, gave a lecture before the Sheffield Society of Architects and Surveyors on the 8th inst. upon "The Law of Support for Buildings." After dealing with certain exceptional cases, he stated that the general rule was that a right to lateral support from adjoining property might be acquired for a building which had enjoyed that support peaceably and without interruption for twenty years. He explained the circumstances in which the right of support might be acquired, and how it could be hindered, and within what time damages must be claimed. He then dealt with questions of liability where a contractor was employed, and with what had to be done for avoiding damages; and concluded by a short reference to support for party-walls and flats.

Mr. J. B. Mitchell-Withers (President) occupied the chair. A hearty vote of thanks was accorded, on the proposition of Councillor W. C. Fenton, seconded by Mr. E. M. Gibbs, and supported by Messrs. Roberts (on behalf of the Law Students' Society), W. G. Buck, C. B. Flockton, T. Winder, W. S. Purchon, J. E. Whitehead, A. C. Caporn, and the President.

Nottingham Architectural Society.

The fourth meeting of the Designing Club was held on February 13, the President, Mr. Robert Evans, presiding.

The subject set was, "A Carriage Porch and Entrance to an Hotel." Six designs had been submitted and Mr. F. E. Littler, Associate of the Royal Institute, who had prepared the conditions, gave an interesting criticism upon them. He remarked upon the general excellence of all the drawings and gave credit for the various good points in each, but called attention to the fact that some competitors had not followed the conditions in the matter of scale, etc., and impressed upon the students that it was a very important point in entering any competition to keep to the conditions.

Upon being asked to place the first three his award was as follows:—1, Garcon; 2, Carbon; 3, Fiasco.

At the close the President said they were greatly indebted to those members who gave their time to setting and criticising the designs in these competitions, and he proposed that their best thanks be accorded to Mr. Littler. Mr. Swann seconded, and it was heartily approved.

GENERAL NEWS.

The New Capital of Delhi.

Liverpool Health Committee recommend that the Council accede to the request of the Secretary of State for India that the Corporation should lend the services of their City Engineer, Mr. J. A. Brodie, to the Government of India for a few months to advise them as to the laying-out of the new capital at Delhi, subject to the Government making satisfactory arrangements with the City Engineer in regard to his remuneration and expenses, and to their refunding to the Corporation the amount of the City Engineer's salary during his absence.

London University Site.

In connexion with the provision of a site for London University it is announced that the Duke of Bedford has granted an option to purchase four plots of land, covering an area of nearly two and a half acres, near the British Museum. The plots lie on either side of the new avenue leading across Montague-place and Keppel-street into Torrington-square.

Hampton Court House.

Hampton Court House, the front of which faces the Green and the rear of which abuts on Bushey Park, is shortly to be demolished. Messrs. Knight, Frank, & Rutley have now submitted plans to the Hampton Council for the development of the grounds comprising the estate, and have asked the Council to state definitely that they would not object to the scheme provided the plans and general intentions regarding the buildings to be erected are otherwise satisfactory. The matter has been considered by the Council, who have replied that they will be prepared to consider favourably a proposal to construct a circular road, provided that complete plans are submitted showing the construction of the buildings in accordance with the Council's by-laws.

Suggested Sale of St. Botolph's.

Nothing has as yet been decided concerning the Church of St. Botolph Without, Aldersgate, which it was reported would be sold to make way for offices. It is stated on the authority of the Vicar, the Rev. C. O. Becker, that no proposal has been carried through, and that the question of sale is only under discussion.

Sanitary Building Construction.

A lecture on this subject by Professor Henry Adams, M.Inst.C.E., M.I.Mech.E., etc., illustrated with lantern slides, will be given at a sessional meeting of the Institute of Sanitary Engineers to be held at Caxton Hall, Westminster, S.W., on Monday, February 26. Mr. Edwin T. Hall, F.R.I.B.A., F.R.San.I., will take the chair at 8 p.m.

The Surveyors' Institution.

The programme of papers to be read at ordinary general meetings of the Surveyors' Institution during the remainder of the session has now been settled by the Council as follows:—

February 26 (afternoon meeting).—"The Tendency towards Uniformity in Compensation for Agricultural Improvements," by Mr. Leslie S. Wood (Fellow).

March 11.—The adjourned discussion of Mr. Edwin Savill's paper on "The Single Tax Movement," to be opened by Mr. H. Trustram Eve (Fellow).

April 15.—"The Cost of Labour in Connexion with the Erection of Buildings," by Mr. R. M. Kearns (Fellow).

April 29.—"Some Principles in the Valuation of Land and Buildings," by Mr. G. T. Loban (Fellow).

May 13.—"The Mortgage of Real Estate as Affecting Values," by Mr. A. S. Cox (Fellow).

The Church Building Society.

The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting on the 15th inst., at the Society's House, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at Frimley Green, St. Andrew, Surrey, 60*l.*; and Preston, St. Matthias, Brighton, 110*l.*; rebuilding the Church of St. Peter, Stanley, Yorks, 80*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Cropredy, St. Mary, Oxon, 10*l.*; Upwood, St. Peter, Hunts, 10*l.*; Southend-on-Sea, St. John the Baptist, 50*l.*; and Weymouth, St. Paul, 25*l.*; making in all 225*l.* Grants were also made from the Special Mission Buildings Fund towards building mission churches at Borth-y-Gest, Portmadoc, Carn., 20*l.*, making in all 50*l.*; Newport, St. James, Mon., 40*l.*; and Trebanos, Clydach, Glam., 40*l.* The following grants were also paid for works completed:—Hanborough, St. Peter, near Oxford, 25*l.*; Hoxton, Christ Church, Middlesex, 50*l.*; Hollinwood, Emmanuel, Lancs., 80*l.*; Forest Town, St. Alban, Mansfield Woodhouse, Notts, 100*l.*; York, St. Luke, 75*l.* on account of a grant of 150*l.*; South Bermondsey, St. Bartholomew, Surrey, 40*l.*; and The Brook Mission Church, Chatham, 30*l.* In addition to this the sum of 470*l.* was paid towards the repairs of nineteen churches from Trust Funds held by the Society. The Secretary reported the receipt of an anonymous contribution of 500*l.* to the Society's funds.

City of London Fire Inquests.

On Wednesday last week Dr. F. J. Waldo addressed, by invitation, the members of the Farringdon Ward Club at Anderton's Hotel. His subject was the history, working, and results of the City of London Fire Inquests, and, in the course of his remarks, he said that under the City of London Fire Inquests Act wide powers were conferred on the coroner to make private and preliminary investigations on his own initiative into any case of fire reported to him by the Police or the Fire Brigade Service. The method now in force is for the coroner and his jury to inspect the burnt premises, together with any officials the jury may wish to consult. Dr. Waldo stated that his predecessor, the late Mr. Langham, held eighty-five fire inquests, while he, himself, had held forty-eight between 1901 and 1911. The result of these fire inquests may be fairly inferred from the steady decrease of fires; during the

past five years there has been an average annual decrease of thirty-eight fires, as against that of the five years immediately preceding the passing of the Act in 1888. Again, in the year 1902, 47 per cent. of fires were reported as of unknown origin as against 25 per cent. in 1905. The proportion of serious fires has also considerably decreased; whereas the figures for the rest of London show a steady increase, both in frequency and in seriousness.

Theatre Royal, Worcester.

This theatre was destroyed by fire early on Monday morning last, and the only part of the building saved was the dressing-rooms. The theatre was rebuilt about ten years ago.

Clerk of Works to St. Paul's.

The Dean and Chapter of St. Paul's have appointed Mr. Bolwell to be their clerk of the works.

COMPETITION NEWS.

Port of London Offices.

We are informed by Sir Aston Webb that the date for sending in preliminary designs for this building has been extended from February 17 to March 9.

School, York.

The drawings submitted in the competition for the new elementary school in Campleshon-lane, York, were due to be sent in on Saturday last; 202 sets of designs were received.

The cost of the school, which will accommodate 550 in the boys' and girls' department and 250 in the infants', is not to exceed 10,000*l*. The assessors appointed by the committee are Messrs. T. Mellard Reade & Son, of Liverpool. The conditions were notable for the wide scope they allowed to competitors as to the type of school to be adopted.

Rhos Chair Eisteddfod.

Prizes of 10*l*. and 5*l*. are offered for a pair of workmen's cottages, Mr. Raymond Unwin, F.R.I.B.A., being the assessor. Clause 5 is as follows:—"The prizes will be paid in accordance with the adjudicator's award, but no competition will take place and the prizes will be withheld unless there are six entries at the least, received before May 6, 1912." This contradicts Clause 9, which says that designs must be sent in by May 1: but that is a minor point.

Municipal Buildings, Sofia.

In reference to the competition for Municipal Buildings at Sofia, H.M. Consul-General at Sofia writes as follows:—

"The prize for the competition for a design for the new Municipal Palace at Sofia was not awarded, but amounts of 3,250 francs and 2,250 francs were paid for the two best designs submitted by M. Nikola Lazaroff, Boulevard Dondoukoff, Sofia, and 1,000 francs for the third best, submitted by M. Nesheff, architect, Sofia. It is understood that the design for the palace will be based on the above plans, and at a later date the construction of the building will be put up to public contract." No responsibility is accepted in regard to the standing of firms or individuals mentioned.

BOOKS RECEIVED.

THE PRECISE CALCULATION OF PIPE, DRAIN, AND SEWER DIMENSIONS FOR USE IN WATER SUPPLY, DRAINAGE, ETC. By C. E. Housden. (London: Longmans, Green, & Co. 2s. 6d. net.)

OUR HOMELAND CHURCHES AND HOW TO STUDY THEM. By Sidney Heath. (London: The Homeland Association. 2s. 6d. net.)

COPYRIGHT LAW AND THE COPYRIGHT ACT, 1911. By Henry Hurrell. (London: Waterlow & Sons. 3s. 6d. net.)

BRITISH CLAYS, SHALES, AND SANDS. By Alfred B. Searle. (London: Charles Griffin & Co. 7s. 6d. net.)

THE CLAYWORKERS' HANDBOOK. By Alfred B. Searle. (London: Charles Griffin & Co. 6s. net.)

CORRESPONDENCE.

Architects, Clients, and Specialists.

SIR,—Your leading article in last week's issue is so entirely true that one would wish every client could have the opportunity given him to digest it. Looking at the various points you raise, the first is that an architect cannot reasonably be expected to enlist the aid of professional specialists at his own expense. May I say that a considerable percentage of my work is given to me by architects who pay me out of their own pockets? I understand from them that their reasons for so doing are:—

(1) They will have unbiassed judgment.

(2) They do not have to place themselves under obligations to specialist sub-contractors, who will always assist an architect with an eye on the future.

(3) They reduce their risks of mistakes and even failures to a minimum.

A considerable proportion of my work is also for architects who have little difficulty in persuading their clients to pay two commissions.

That is to say, the architect receives his usual fees on the whole of the work, and I also obtain my usual fees on my part of that work.

Every client in such cases has, so far, realised that he was benefiting by doing so.

PROFESSIONAL SPECIALIST.

Trade Unionism and Restraint of Trade.

SIR,—On page 181-2 of your issue dated the 16th inst. you quote at length from an article appearing in the *National Review* by the Countess of Stradbroke on "Trade Unionism and Character." Based upon a statement that the trade union prevents the bricklayers from laying more than a given number of bricks per day, deductions are made and arguments advanced claiming that the trade unions operate in restraint of trade and are inimical to the interests of the community.

I hold no brief for the trade unions, but, during a lifetime spent in the building trade I have seen this statement very often, both in your pages and elsewhere.

Is it a true statement, or is it untrue?

If it is true, surely some of the many builders who read your pages can give us uncontradictable facts and data which will put it beyond question. If it is untrue, then, in justice and fairplay, let it be stopped. My own experience may be given for what it is worth. For some years I was a member of a trade union; there were no by-laws or rules in that union which in the slightest degree had a bearing upon how much or how little work a member had or had not to execute. I attended many branch meetings in three of the principal cities; at no meeting have I heard the question raised or discussed. I have met thousands of trade union workmen, and still have never known the question to be raised. Indeed, my experience has been to the contrary; I found that a lazy workman or a malingerer was deprecated by the union officials. For sixteen years I have been supervising the erection of large public buildings in the north, south, east, and west of England, and yet I have not known of an instance in which the trade unions have interfered with the quantity of work executed by any one of their members. But as the statement is generally applied to bricklayers, I have procured a copy of the full rules and by-laws of the Operative Bricklayers' Society. It is on the table before me now. I have carefully searched page by page and cannot find the slightest reference to the quantity of bricks its members may or may not lay per day, nor can I find anything which has the remotest bearing on the subject or anything which could possibly be strained into having a bearing on the subject. I have questioned the bricklayers (unionist and non-unionists) on my buildings, and from all I have had the same reply—the unions do not interfere with their members regarding the quantity of work they may or may not do.

In the face of these inquiries and my own experience, am I to believe that if a bricklayer lays more than a given number of bricks per day the union finds fault or restrains him?

Amongst architects and the public generally the statement is commonly believed—it is quite accepted as true—that the union restricts the output of the bricklayers. We have it reiterated by the Countess of Stradbroke in the *National Review*.

It is conceivable that on some buildings the bricklayers (both unionist and non-unionists) have put their heads together and agreed they would not lay more than a stated number of bricks per day—personally I have never met with this experience—but what has an occurrence of this description got to do with the trade unions? It would happen just the same if there were none, and in any case must be extremely rare. The value of the Countess of Stradbroke's article depends entirely on the correctness of the statement that the trade unions prevent their members from doing more than a given quantity of work per day, and if this is incorrect, her article is of no value, because her deductions must all be wrong. She refers particularly to the bricklayers, and I maintain that this statement with reference to the bricklayers' trade union is not in accordance with facts. Owing to the labour unrest, the subject is one of particular interest at present, and may be discussed with great benefit.

X.

INTERCOMMUNICATION COLUMN.

Public Swimming-Baths.

SIR,—Will any of your readers who have practical knowledge of the initial expenses and cost of upkeep of a public swimming-bath in a village give the benefit of his experience? I thought of having two or three private baths under the same roof, which may be filled with hot water. What is now considered the most economical way of heating water for this purpose? Has there been any improvement on the geysers? What charges should be made to ensure a bath being self-supporting, and to what number of bathers? How should the caretaker be arranged for? The village contains about one thousand inhabitants.

WELWYN.

Echo.

SIR,—I wonder if any of your readers would be able to give me any information as to what is the easiest way to cure an echo? Some six months ago I completed a ballroom in Cheshire, which is 50 ft. long by 25 ft. broad, with a bay-window in the centre of one of the side walls and a fireplace recess opposite. The roof is segmental in form, springing off the cornice, 13 ft. from the floor level and rising to 19 ft. in the centre. This room is used as a music-room on ordinary occasions, so the echo (which mercifully is not very bad) is a distinct nuisance. Naturally I wish to avoid having to stretch unsightly wires across if this can be in any way prevented. Thanking you in advance,

A BEGINNER.

Staircase, Devonshire House.

SIR,—Can you or any of your readers give some account of the staircase at Devonshire House, especially the handrail? Or say where a description is to be found?

R. C.

FIFTY YEARS AGO.

From the *Builder* of February 22, 1862.

St. Thomas's Hospital.

TWO VERY important questions present themselves with reference to this hospital—the question of site and that of architectural design and arrangements. The *Times*, in speaking as to site, appears to consider that those who, like ourselves, have urged the advantages of a suburban site for the recovery of patients, contemplate nothing less than the total removal of the hospital and all its appendages; whereas, so far as regards ourselves at least, we have ever kept in view the necessity and advantage of having an establishment connected with the hospital placed somewhere in the neighbourhood whence it is about to be removed. As for the immense advantages of a suburban site to the recovery of the patients—which surely is a question above all else for consideration—there cannot be a doubt, and if the governors are unwilling to remove the principal establishment from London, with such means as they possess—between 30,000*l*. and 40,000*l*. a year, and rapidly on the increase, besides a very large sum from the railway company for the express purpose of building the required new hospital—surely they ought at least to have an extensive establishment also in the suburbs, within easy time distance from their town establishment, and whereto every possible case could be transferred at the earliest available moment.

EDITORIAL SUMMARY.

Our leading article deals with Labour Questions and Nationalisation and Insurance.

A second article on the "Architectural Societies of France" refers at length to La Société des Architectes Diplômés par le Gouvernement (p. 200).

In "Notes" Column (p. 201) will be found observations on: "Victoria and Albert Museum"; "The Society of Twelve"; "Bridges"; "Site for London University"; "Further Improvement for the Marble Arch."

A meeting of the Royal Institute of British Architects was held on Monday, when Mr. Edward Warren read an interesting paper on "Collegiate Architecture." (See p. 202.)

Our report of the combined meeting of the Architectural Association and the Junior Institution of Engineers, when a paper on "Bridges" was read by Mr. Paul Waterhouse, M.A., is continued on p. 204.

In Architectural Societies (p. 207) will be found short reports of: "Sheffield Society of Architects and Surveyors"; "Birmingham Architectural Association"; "Nottingham Architectural Society."

In Correspondence columns (p. 203) will be found letters on: "Trade Unionism and Restraint of Trade"; "Architects, Clients, and Specialists."

The Monthly Illustrated Review of Engineering (p. 211) includes: "Reinforced Concrete in Great Britain"; "Æsthetic Treatment of Concrete"; "York Tower Collapse"; and Notes.

In the Building Trade Section (p. 215) will be found: "How to Cheapen Transport"; "Manchester Building Trades Exhibition"; "Standard Time Rates of Wages"; "Builders' Clerks' Benevolent Institution."

The last of Professor Reginald Blomfield's Royal Academy lectures on "Architectural Draughtsmanship" was given on Thursday last week, and an abstract appears on p. 218.

The fourth of the present series of Carpenters' Hall lectures on "Arts Connected with Building" was given on Wednesday last week by Mr. T. Stirling Lee, the title of whose address was "The Sculptor's Craft," with demonstrations. (See p. 218.)

Book Notices (p. 219) include: "Memorials of Old Gloucestershire"; "Laxton's and Lockwood's Price Books"; "Everybody's Guide to the National Insurance Act."

An article on the "Traffic Report of the Board of Trade" is given on p. 220.

In Legal Column (p. 221) are some observations on: "Obstruction to Light"; "Mistake at an Auction."

In Law Reports (p. 221) will be found: "Padbury *v.* Holliday & Greenwood, Ltd."; "Chapman *v.* Greenwood, Ltd."; "London County Council *re* Euston-road Building Line."

MEETINGS.

FRIDAY, FEBRUARY 23.

The Royal Institution.—Mr. George K. B. Elphinstone on "The Gyrostatic Compass and Practical Applications of Gyrostats." 9 p.m.

Royal Academy of Arts.—Mr. A. P. Laurie, M.A., D.Sc., on "The Chemistry of Pigments." 8 p.m.

Leicester and Leicestershire Society of Architects.—Paper by Mr. H. L. Goddard, M.A., entitled "Rambles and Reminiscences." 8 p.m.

Institution of Civil Engineers (Students' Meeting).—The Vernon-Harcourt Lectures on "Works for the Prevention of Coast Erosion," by Mr. W. T. Douglass, M.Inst.C.E. 8 p.m.

SATURDAY, FEBRUARY 24.

The Royal Institution.—Professor Sir J. J. Thomson, M.A., D.Sc., on "Molecular Physics"—I. 3 p.m.

Builders' Foremen and Clerks of Works' Institution.—Annual dinner, Holborn Restaurant. 6 p.m.

MONDAY, FEBRUARY 26.

Architectural Association (Combined Camera, Sketch, and Debate Club Meeting).—Mr. F. C. Eden on "Hopes and Fears for Architecture." 7.30 p.m.

Royal Sanitary Institute.—Mr. Alan E. Munby, M.A., on "Elementary Science: Physics, Chemistry." 7 p.m.

Institute of Sanitary Engineers (Caxton Hall).—Professor Henry Adams on "Sanitary Building Construction." 8 p.m.

The Surveyors' Institution.—Mr. Leslie S. Wood on "The Tendency Towards Uniformity in Compensation for Agricultural Improvements." 5 p.m.

TUESDAY, FEBRUARY 27.

The Royal Institution.—Professor Ernest G. Coker, M.A., D.Sc., on "Optical Determination of Stress, and Some Applications to Engineering Problems"—I. 3 p.m.

Royal Sanitary Institute.—Mr. Alan E. Munby, M.A., on "Elementary Science: Physics, Chemistry." 7 p.m.

Nottingham Architectural Society.—Mr. W. Bond on "Church Restoration." 8 p.m.

Northampton Polytechnic (Illuminating Engineering).—Dr. W. Ettles on "Physiological Factors in Illumination." 7.30 p.m.

Institution of Civil Engineers.—(1) Paper to be further discussed: "Some Features of the West African Government Railways," by Mr. F. Shelford, B.Sc.; (2)—time permitting—papers to be read: "Roller and Ball Bearings" and "The Testing of Anti-friction Bearing Metals," by Professor John Goodman. 8 p.m.

WEDNESDAY, FEBRUARY 28.

Carpenters' Hall, London-wall (Lectures on Arts Connected with Building).—Mr. M. H. Baillie Scott on "House Building, Past and Present." 7.45 p.m.

Royal Sanitary Institute.—Mr. Alan E. Munby, M.A., on "Elementary Science: Physics, Chemistry." 7 p.m.

Royal Society of Arts.—Mr. H. A. Roberts, M.A., on "The Relations of Science to Commerce and Industry." Principal Sir Henry A. Miers, M.A., D.Sc., F.R.S., in the chair. 8 p.m.

THURSDAY, FEBRUARY 29.

Carpenters' Hall (London-wall).—Mr. Banister F. Fletcher on "The Tower of London." 8 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, MARCH 1.

Royal Sanitary Institute.—Mr. Edward Willis on "Calculations, Measurements, and Plans and Sections." 7 p.m.

Glasgow Architectural Craftsmen's Society (Technical College).—Mr. Robert Moon on "Various Timbers and their Practical Uses." 7.45 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. H. J. F. Gourley, B.Eng., on "The Design and Construction of Masonry Dams." 8 p.m.

ILLUSTRATIONS.

Stafford Public Library.

LAST week we noticed some of the competition designs sent in for the Stafford Public Library, and we now illustrate the design placed first and the second and third premiated designs.

The authors of the design placed first, Messrs. Briggs, Wolstenholme, & Thornely, FF.R.I.B.A., of Liverpool and Blackburn, write:—

"The building is entirely isolated from others which may be hereafter erected on the adjacent site, which safeguards it against fire, and secures many other advantages. An alternative boundary line is suggested to that given in the instructions, which would enable the building to occupy rather less land. The principal entrance is placed at the apex of the site, the same being emphasised by a semi-circular portico boldly treated, forming a striking architectural feature as viewed from Bridge-street. The entrance hall, which is spacious without being wasteful, gives direct access to the ladies' room, newspaper-room and magazine-room, and also to the lending library. Close to the entrance a public telephone-box is provided, which enables it to be used without bringing the public far into the building.

Immediately facing the principal entrance, after passing through a pair of swing doors, the borrowers' counter, with indicators, is placed, at the rear of which are the book stacks in slightly fan-shaped form.

The position of the attendants' space in the lending library is such as to ensure their commanding a complete view of the whole of the lending department, news and magazine and ladies' room, and entrance hall.

This department is well lighted by means of a series of dome lights, each of which is provided with ventilating extractors. The windows in the east wall are provided mainly for the purpose of ventilation. The book stacks are 7 ft. high, and accommodate 12,000 volumes, as shown on the plan.

The newspaper-room runs uninterruptedly along the frontage to Bailey-street. Large windows are spaced evenly along the external wall, sufficiently high above the floor to allow newspaper wall stands to be placed under them; the centre of the rooms in which the tables are placed is, therefore, not obstructed by high fittings.

The magazine-room and ladies' room occupy the frontage towards Lichfield-road, and it is suggested they should be divided by glazed screens architecturally treated, which will facilitate supervision and give a more spacious effect to these rooms.

The book store is placed in convenient relation to the lending department, and is in close connexion with the reference library by means of the book lift and staff staircase.

The staff lavatory is adjoining the staff entrance. The cleaners' sink-room is provided under the staircase near the entrance, from which a staircase leads down to the heating chamber.

The reference-room is placed upon the first floor, and is lit with vertical lights placed on either side high up in the room above the book stacks, which it is suggested should be placed round the whole of the room. The librarians' office is also provided on this floor, and is approached either by means of the staff stair from lending library or through the reference library, which it commands. The caretaker's day-room is also suggested on this floor, which would ensure the reference-room being under supervision during the whole day.

We have suggested the possibility of a future lecture-room. It is quite probable that this will be built immediately, with lecturers' retiring-room over the staff lavatory.

The heating chamber has been placed in the basement on the Bailey-street frontage, with a coal shoot, so that coal and coke may be tipped direct from the side street into the coal-cellar. Access to the heating chamber is obtained under the staircase, so that the caretaker would not have to traverse the library from his day-room in attending to the heating.

The walls will be constructed of common brick, faced with approved wire-cut facing bricks or sand stocks 2 in. thick. The stone dressings to be of Hollington or other approved stone which has been found to weather well in the neighbourhood.

The ground floors throughout to be of Portland cement concrete, with 1-in. floated surface finished with cork linoleum. The entrance vestibule to have a floor of black and white marble.

The first floor would be constructed of fireproof flooring and floated with cement finished with cork linoleum, as provided on the ground floor. The whole of the internal woodwork to entrance hall, borrowers' counter, and screens on ground floor will be of American white oak quarter cut. The internal woodwork of other parts of the building to be of American whitewood stained oak colour and dull polished. The building will be lighted by electricity, with drop pendants arranged in suitable positions for the readers. The heating will be on the low-pressure hot-water system, the boiler being the National Radiator Company's "Ideal," or other suitable pattern. Ventilating radiators will be placed under the windows and in other suitable positions. Ventilating flues will be provided to all the rooms terminating on the external face of the walls. A small fan will be provided in the ceiling of the reference-room.

An endeavour has been made in planning the building to let the elevations express the plan in a simple and dignified manner."

Messrs. Sutton & Gregory, of Nottingham, the authors of the second premiated design, write:—

"In preparing our design it has been our endeavour to arrange the public rooms in such a manner that perfect supervision is obtained with a minimum of staff. The attendant in the lending library has direct supervision of the staircase to the upper floor, entrance hall, newsroom, and magazine-room. The rooms on the first floor are under the immediate control from the librarian's-room.

The magazine-room and reference library are on the right of the entrance hall and away from the noise of the traffic of the main road. The newspaper-room and ladies' room and librarian's office are on the left of the entrance hall. The caretaker's-room is placed on the ground floor, near the back entrance and heating chamber, and also in direct communication with the staff in the lending library. A store is placed in this room for the preparation of meals. The following accommodation is provided on the ground floor:—Newspaper-room, 822 super. ft.; magazine-room, 600 super. ft.; lending library, 913 super. ft., with shelving for 12,800 volumes; book store, caretaker's-room. On the first floor—reference-room, 714 super. ft.;

ladies' room, 350 super. ft.; librarian's office, 351 super. ft.

The cubic contents are as follows :—

Foundations, 16,800 ft. at 5d., 350*l.*; superstructure, 84,840 ft. at 10d., 3,535*l.*; boundary wall, etc., 100*l.*; total, 3,985*l.*"

Third Premiated Design.

The authors of the third premiated design, Messrs. Castle & Warren, Norfolk-street, Strand, London, write :—

"The intention of the authors of the third premiated design was to embrace the accommodation by taking up the smallest possible amount of space on the site, thus to arrive at a compact scheme from the points of view of limitation of cost and concentration of supervision. In this way all the rooms are supervised and controlled by a staff of three (two at the service counter, and the librarian in a central position upstairs) and a porter on the entrance.

The ell-shaped lending library in this particular case is considered a great advantage, and the required storage of volumes was just provided for, and the 40-ft. length of counter as required.

The magazine-room in actual practice being frequented only as a rule by quite desirable readers, no objection was seen to the position of the ladies' room, and none would be felt in actual execution.

The scheme was entirely dictated by the cost, and the elevations were based on extremely simple lines in view of this."

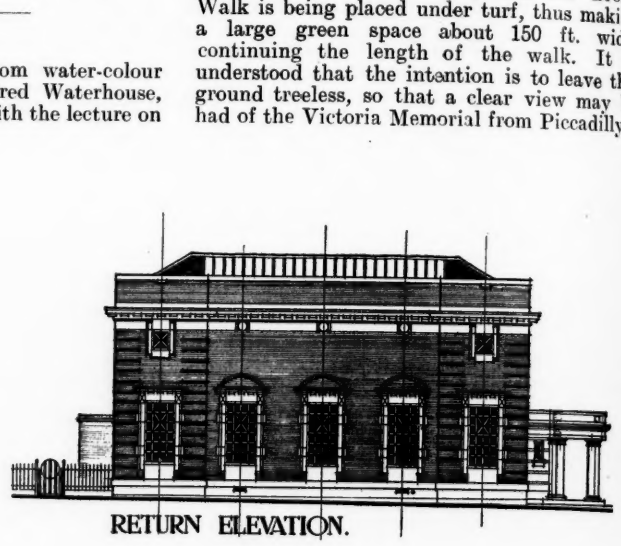
Bridges.

THESE two illustrations, from water-colour drawings by the late Mr. Alfred Waterhouse, R.A., are given in connexion with the lecture on "Bridges" which Mr. Paul Waterhouse recently delivered before the Architectural Association, the second part of which appears on another page. The drawings and many others by the same artist were shown on the occasion of the lecture.

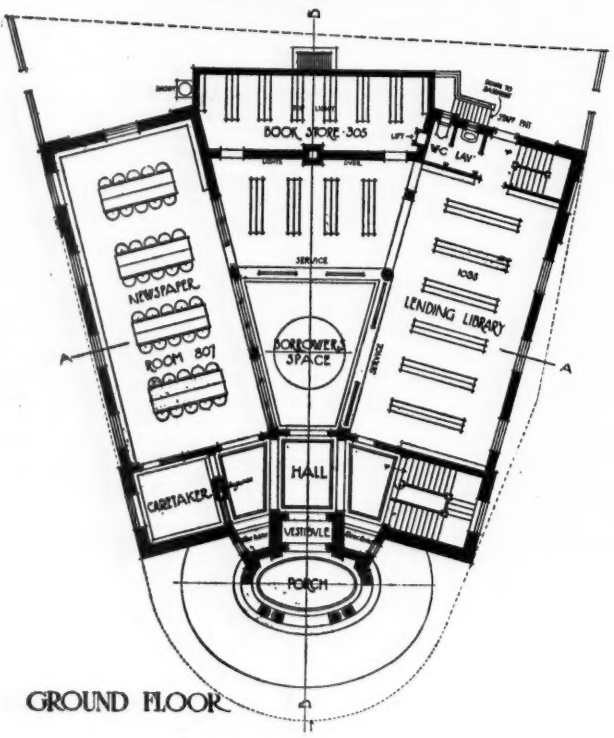
GREEN PARK ALTERATIONS.

The Broad Walk of Green Park is now being reconstructed. Instead of the wide path which was opened from Buckingham Palace-gate to Piccadilly a few years ago, two gravel paths of about 15 ft. wide each are being constructed at either side, and the Broad Walk is being placed under turf, thus making a large green space about 150 ft. wide, continuing the length of the walk. It is understood that the intention is to leave this ground treeless, so that a clear view may be had of the Victoria Memorial from Piccadilly.

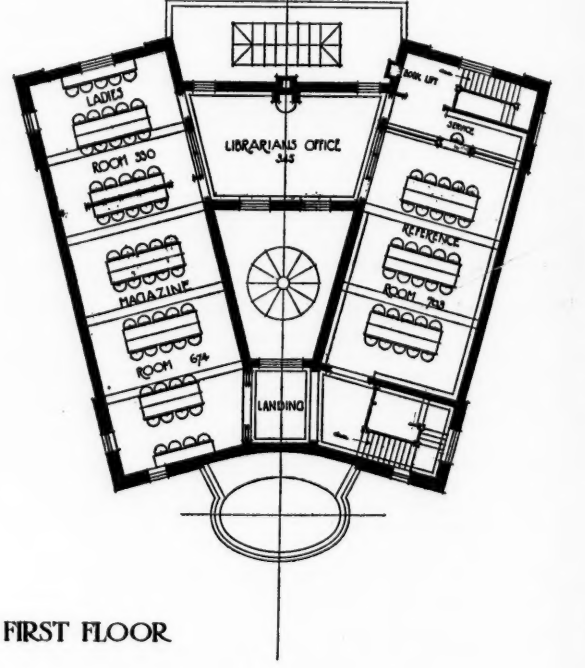
ANGLE ELEVATION



RETURN ELEVATION.

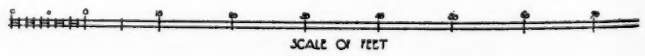


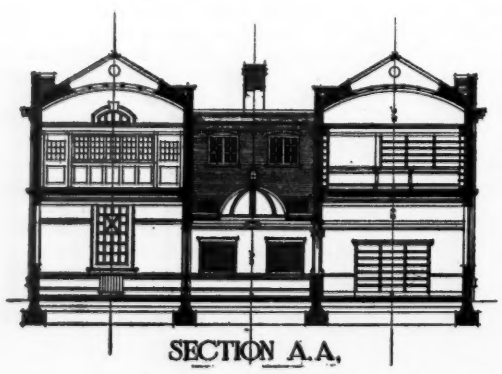
GROUND FLOOR



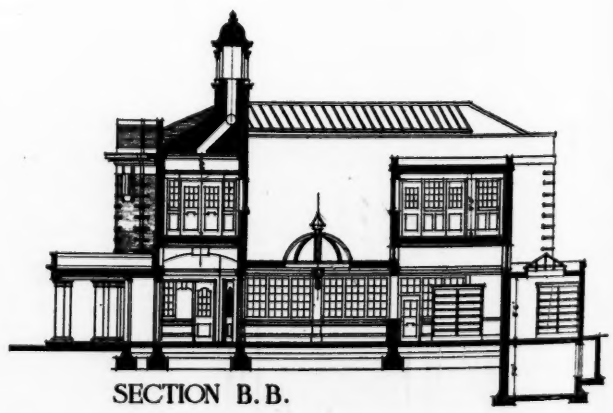
FIRST FLOOR

BASEMENT





SECTION A.A.



SECTION B.B.

Stafford Public Library Competition : Third Premiated Design, by Messrs. Castle & Warren.

MONTHLY REVIEW · *of* · ENGINEERING.

REINFORCED CONCRETE IN GREAT BRITAIN.—II.

By W. NOBLE TWELVETREES.

(Continued from page 98.)

Classification of Systems.

THE various systems of reinforced concrete employed in Great Britain may be conveniently considered under two heads:—

(*a*) Those representing a special arrangement of ordinary steel bars, rods, wire, or strip constituting the reinforcement, and in which the reinforcing units are prepared as may be necessary on the site of the works to be executed, and after having been placed and temporarily fixed in the moulds as required by the working drawings are afterwards held in position chiefly by the embedding concrete; and

(*b*) Those characterised by the employment of specially formed bars or meshwork, or of plain bars to which special types of auxiliary reinforcement are attached in suitable manner.

It should be noted that systems of class (*a*) are simply intended to provide for the application of steel to such parts of the concrete as require reinforcement for the resistance of tensile, compressive, and other stresses. Their advocates believe ordinary mercantile forms of steel to be quite adequate, more convenient, and less costly than specially formed bars. But there is no reason why any of the systems in question should not be applied in connexion with some of the special types of reinforcement on the market if such a course were thought advisable.

Although certain details in most systems of class (*a*) are protected by patents, the firms making a speciality of the systems appear to be gradually acquiring a status somewhat akin to that of structural engineers generally, and their experience is probably considered by clients to be quite as valuable as the system with which each of them is identified.

While systems of class (*b*) are distinguished by the various special forms of reinforcement employed, such types of reinforcement do not in themselves constitute a "system" strictly so called, and it is necessary that the reinforcement should be applied in accordance with the fundamental principles of reinforced concrete construction. Special bars and auxiliaries do not in any way obviate the need for scientific design, and it should be clearly understood that purchasers must either have at command the requisite technical knowledge or procure designs from the firms by whom the reinforcement is sold. Most of these firms lay themselves out for the preparation of designs, and consequently are very much in the same position as specialists having systems placed under class (*a*).

In the following summary the characteristics of the principal systems are given briefly, with special regard to the uses of reinforced concrete in building practice, and attention has been confined to systems suitable for the design and construction of complete buildings.

Systems of Class (a).

Hennebique System.—In 1879, when engaged as a contractor for public works and buildings, M. François Hennebique constructed reinforced concrete floors, and ever since that date has been connected with the same class of construction. In 1892, being then established in Brussels, M. Hennebique first introduced a clearly defined system as set forth in his British patent of 1892 relating to "improvements in the manufacture or construction of joists, girders, and the like." The complete specification claims, among other things, the assemblage of two appropriate materials, such as iron and cement, in such manner that the tensile resistance of one material is added to the compressive resistance of the other material; the combination of the two substances in such manner that the one subject to tension is embedded in the lower part of the substance on which the effects of compression are to be exerted, and the upper part only of which becomes of use; the use of round, square, bent, or other bars (*B*) and cement of trapezoidal section (*P*) as being the most practical arrangement; and the use of anchors (*A*) of any suitable form or section, forming with the cement a complete and indissoluble union of the lines of tension and allowing the application to the reinforced beam of the methods of calculation for lattice work girders, such anchors being placed at intervals determined by calculation. Fig. 1 includes transverse and longitudinal sections of beams constructed as described in the specification, which evinces a correct appreciation of the principles of reinforced concrete design as accepted in the present day.

Two British patents taken out in 1897 denote the development of the Hennebique system to the form in which it is now employed in the construction of beams and floors.

One of these patents describes a beam built in at the ends or continuous over one or more intermediate supports, the reinforcement consisting of straight and bent bars and U-shaped stirrups arranged as shown in section Fig. 2, and in perspective by Fig. 3. The bent-up

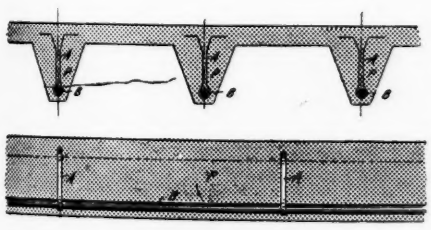


Fig. 1.

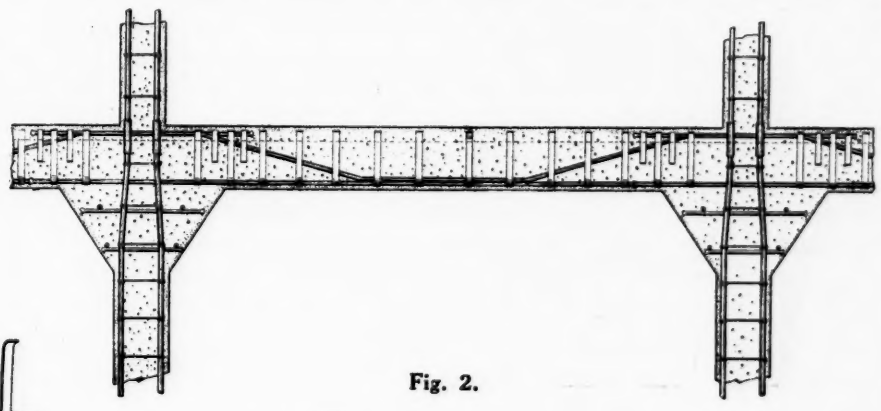


Fig. 2.

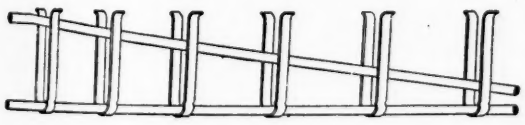


Fig. 3.

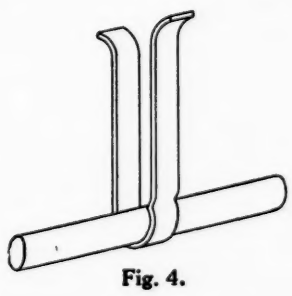


Fig. 4.

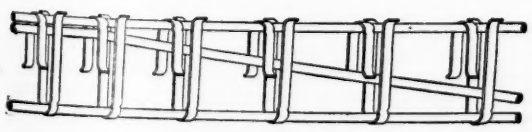
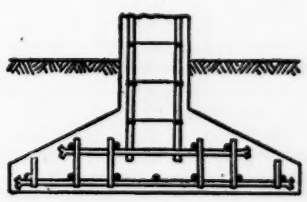


Fig. 5.



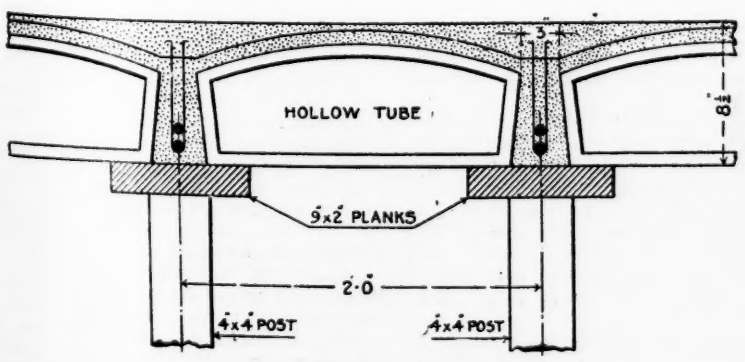


Fig. 6.

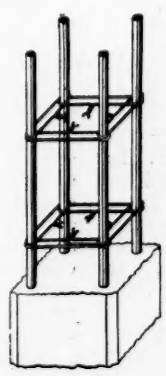


Fig. 7.

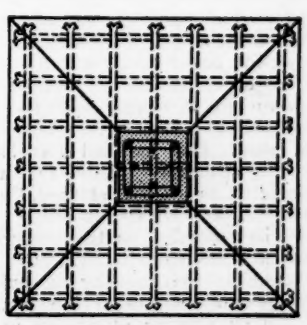


Fig. 8.

Illustrations of Hennebique System.

Fig. 1. Original Beam Construction.
Fig. 2. Beam and Columns.
Fig. 3. Single Reinforcement for Beams.
Fig. 4. Stirrup for Beams.
Fig. 5. Double Reinforcement for Beams.
Fig. 6. Hollow Floor.
Fig. 7. Column Reinforcement.
Fig. 8. Column Base.

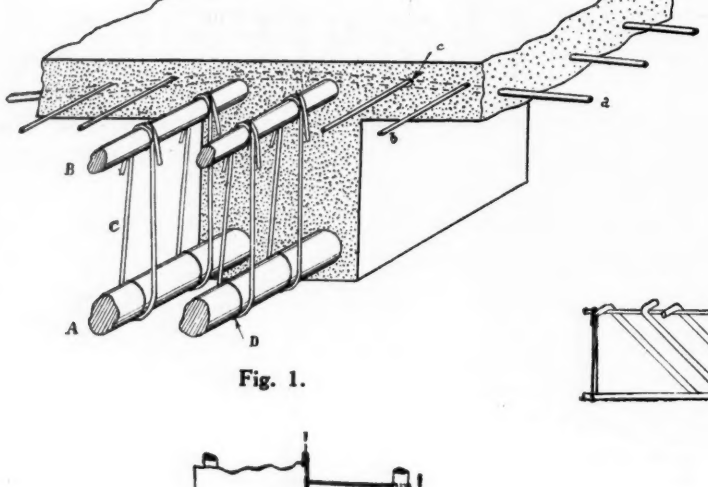


Fig. 1.

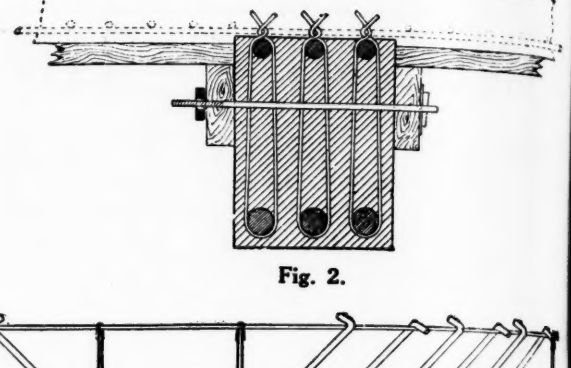


Fig. 2.

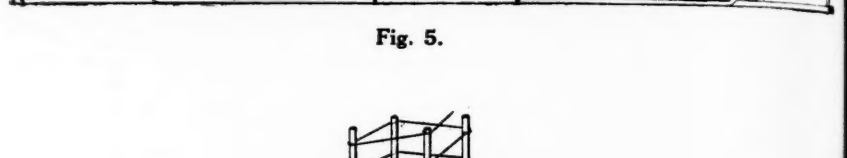


Fig. 5.

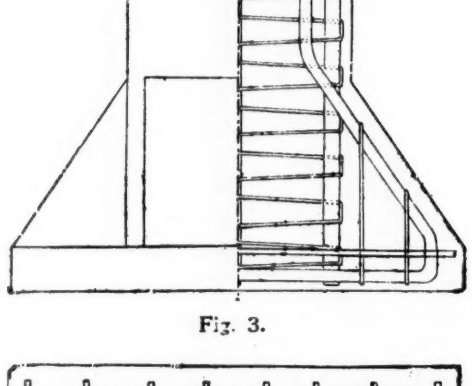


Fig. 3.

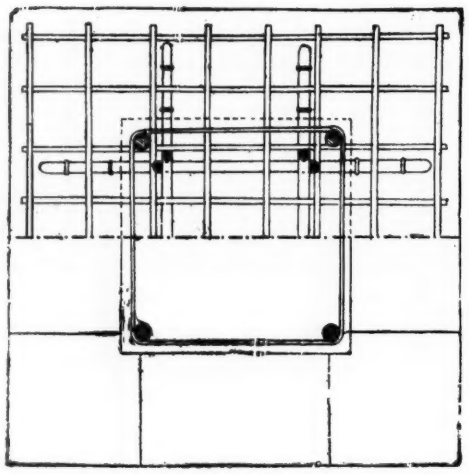


Fig. 4.

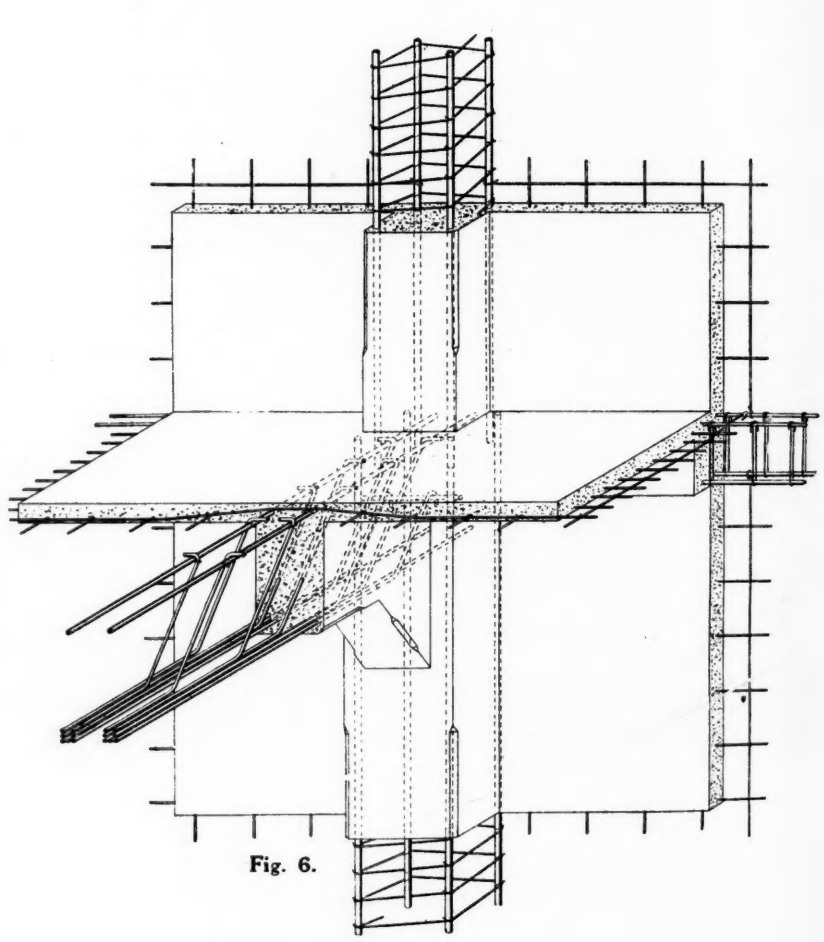


Fig. 6.

Illustrations of Coignet System

Fig. 1. Beam Construction.
Fig. 2. Beam Supporting Floor Centring.
Fig. 3. Column Base Elevation, Half in Section
Fig. 4. Column Base Plan, Half in Section.
Fig. 5. Alternative Method of Beam Construction.
Fig. 6. Various Examples.

bars are carried into the wall in the case of a built-in beam, or taken for some distance over the intermediate supports in continuous beams. The stirrups, now made with a kink as in Fig. 4 to make them grip the main bars, are spaced more and more closely together near the ends of the beam to form a triangle of resistance outside each point of contraflexture. Fig. 5 represents the arrangement of the bars and stirrups for a beam having both tension and compression reinforcement. Floor slabs are reinforced similarly to beams, and are applied so as to act as compression flanges to the beams projecting below them.

The other patent of 1897 provides for the construction of hollow floors composed of slabs moulded in advance and beams moulded on the site. This method has been employed in this country chiefly for the construction of floors for cold storage, the hollow being partly filled with insulating material. It may be regarded as the precursor of several floor systems since introduced with the object of reducing the quantity of centring required, and possibly suggested the Hennebique type of hollow flooring illustrated in Fig. 6. This floor is formed by placing fireclay or concrete tubes in rows on planks temporarily supported by posts, the spaces between the tubes forming moulds for the beams and the upper surface of the tubes forming centring for the covering layer of reinforced concrete.

Columns and struts as originally designed in this system were reinforced by four or more longitudinal bars connected at intervals by flat plates in sets of four, the bars passing through holes in the plates. Such members are now made with sets of wire links (see Fig. 7) as transverse reinforcement in accordance with the patent of 1904.

Column bases are reinforced, as shown in Fig. 8, by two or more sets of bars crossing one another and connected by stirrups similar to those employed in beams.

By the aid of structural elements of the general classes described the foundations, skeleton frame, floors, and roof for a building can be constructed, leaving only walls for consideration. These are usually reinforced by a series of vertical bars near each face of the concrete and a series of horizontal bars in the middle of the wall, the vertical bars being provided with stirrups similar to those used for beams.

A type of reinforced concrete wall patented in 1908 was illustrated and described in the *Builder* of November 26, 1910, to which readers are referred for particulars. This wall consists of special concrete blocks reinforced by a network of rods and jointed by cement mortar in the horizontal and vertical grooves provided for reception of the reinforcing bar.

Among the advantages claimed for the Hennebique system as employed in this country by Messrs. L. G. Mouchel & Partners, Ltd., of Westminster, are the following:—

(1) That the sloping portions of the upward bent bars in beams lie fairly across the lines of possible rupture near the supports, and that the vertical stirrups, being closely spaced in the same portions of the beam, intersect numerous lines of maximum tension which vary considerably in direction.

(2) That the vertical position of the stirrups facilitates ramming without risk of their displacement, and that the spring clip at the bottom dispenses with wedges and wire ties.

(3) That the successive sets of transverse links in columns are more effective in binding the bars and concrete in every direction than a circumferential winding or circular bands.

Finally, we may state that work on the Hennebique system is executed only by licensed contractors, for whom the patentees prepare working drawings and quantities based upon the general designs of the architect or engineer, that the patentees hold themselves responsible for the efficiency of the reinforced concrete designs, and that the contract price covers all payments to the patentees.

Coignet System.—The late François Coignet, of Paris, whose British patent of 1855 has already been mentioned, was one of the first to advocate the advantages to be derived from the combination of iron and concrete in structural practice, although it does not appear that he made any important use of reinforced concrete. His son, M. Edmond Coignet, devoted himself to a study of the subject, and in 1888 and 1894 read papers on reinforced concrete theory and design before the French Society of Civil Engineers. The second of these two papers attracted considerable attention on the part of Continental engineers, and it is worthy of note that the views therein expressed have been in great measure confirmed by the investigations of various scientific authorities.

The Paris Exhibition of 1900 afforded M. Coignet, as well as other pioneers, a good opportunity of demonstrating the valuable properties of reinforced concrete and of making further known the utility of the system which by that time he had formulated on a practical basis.

The first British patent relating to the Coignet system was taken out in 1904, and is entitled "Improvements in and connected with reinforced or armoured concrete construction," and in the same year the system was introduced into this country. In the complete specification, after stating his knowledge "that it has been previously proposed to use various forms of metallic reinforcement for concrete construction, as described, for example, in Specification No. 3,377, A.D. 1883, strengthening bars in the upper parts of concrete beams and floors to resist tensile stresses, helical coils or windings for pipes, culverts, piles, and the like, and metal bars or members for resisting tensile and compressive stresses in concrete constructions generally," the inventor makes the following claims:—

(1) The method of tying together the rods forming the reinforcement of beam flanges and the bar or bars in the compression area of beams by bending over the rods the ends of the web ties (lettered C in Fig. 1) which connect the tension and compression bars of the reinforcement.

(2) The method of reinforcing column bases which is illustrated by Figs. 3 and 4.

(3) Methods of arranging the reinforcement in pipes, circular tanks, and spherical domes, or conical roofs or arches.

Dealing first with beams as described in the 1904 patent, it should be pointed out that the reinforcement preferably consists of round steel bars, and that while the general principle is to rely upon steel for resistance to tension and upon concrete for resistance to compression, yet in practice the concrete is usually reinforced by compression bars (B, Fig. 1), partly for the purpose of reducing the dimensions and dead weight of the members, and partly for the purpose of providing for the connexion of the tension and compression areas by means of the web ties (C), which are secured by annealed wire (D). The latter are arranged at distances governed by calculation, and may be placed obliquely, but the vertical position is always adopted in practice. In cases where a number of tension bars (A, Fig. 1) are used, cross-pieces of steel may be provided so as to distribute the stresses over all the bars. Beams, flanges, or connecting floor slabs are reinforced by principal rods (*a*) and secondary rods (*b*), tied at the intersections by annealed wire, as at *c*, and it should be noticed that these rods are bent down on each side of the beam so as to bring them as near as possible to the tension surface of the concrete. Where a very heavy slab has to be constructed the reinforcement consists of both tension and compression bars connected by web ties, the arrangement being the same as that adopted for beams.

A feature to which importance is attached is that the wiring together of the bars and stirrups gives assurance that their position will not be altered during the process of concreting, and also enables the contractor to prepare the steel skeletons in advance according to the working drawings.

Fig. 2 shows a special arrangement by which the centring for floor slabs may be supported by beams moulded in advance. The main bars of the beam project about a foot at either end for connexion to the supports, and the ends of the web ties project above the beams, so that they may be embedded in the concrete of the slabs afterwards moulded on the site. After the beams have been fixed, the centring is laid on planks secured by bolts passed through holes made for the purpose in the beams at the time of moulding.

Columns of the Coignet type are made of any suitable sectional form, the reinforcement consisting of four or more longitudinal bars bound by horizontal ties or a spiral winding of stout wire or thin steel rods, the lateral reinforcement so formed being held in place by annealed wire. Figs. 3 and 4 show part of a column as described in the specification of 1904, and the manner in which the column base is reinforced.

An alternative type of beam construction is the subject of a patent taken out in 1906, the object of the invention being to provide a reinforcing framework without requiring the web ties involved in the patent of 1904. This framework, illustrated in Fig. 5, comprises a group of tension bars of different lengths, the ends of most of these being bent up at an angle of about 45 deg. and hooked over a compression bar, while the bars are bound together by vertical ties of annealed wire, as shown in the drawing. Additional bars are placed over the intermediate supports of continuous beams to withstand tension due to negative bending moments. The bars in each group are kept about ¼ in. apart to allow the concrete grout to surround each individual bar. As in the case of the other beam design, the skeleton framework can be built up in advance, and the position of the bars cannot well be altered by the work of concreting.

Fig. 6 is a diagram representing the various types of Coignet members already described, and including also part of a wall panel with the method of reinforcement adopted under this system.

The chief advantages claimed for the Coignet system may be thus briefly stated:—

(1) In beams the reinforcement can be completed beforehand and put into place as a complete skeleton, the parts of which cannot be displaced accidentally by the deposition and ramming of concrete.

(2) The form of beam reinforcement with bent-up bars saves both labour and material.

(3) Beams can be moulded in advance and used to carry centring for floor slabs, thereby saving material and labour.

Work on the Coignet system is carried out by licensed contractors, whose estimates or tenders include provision for the drawings and other technical details prepared by the patentees in accordance with the general designs of the architect or engineer under whose superintendence the works are executed.

THE ÆSTHETIC TREATMENT OF CONCRETE.

SIR HENRY TANNER, F.R.I.B.A., presided over a meeting of the Concrete Institute on February 8, at Denison House, S.W., when the discussion was resumed on the paper which Professor Beresford Pite read before the Institute on June 7 of last year.*

In view of the length of time which had elapsed, the author again read his paper and afterwards exhibited a number of lantern slides of ferro-concrete buildings. He pointed out where in practically every instance æsthetic treatment was lacking.

Mr. A. Alban H. Scott

remarked that with this new material problems arose which did in every way alter constructive work. One point brought out recently was the treatment of floors. In other materials it was necessary to introduce beams of greater depth than the floor itself, but now with reinforced concrete they were able to keep the whole of the ceiling flat. He thought this was a proper and legitimate treatment of the material, although perhaps it would not conform to the grammar of architecture. He did not think concrete necessarily required coarse treatment, but it should be treated with the highest degree of refinement.

Mr. A. T. Bolton

said what to do with a new material involved a vast amount of thought. Many of those present would probably like the best analysis of that very difficult subject. It was Garbett's "Architectural Design," which was written about the time of the Gothic revival and contained a good many things which would be considered absurd nowadays. The main lines of it were, however, remarkably good, and there was a very curious prophecy in the book which the photograph of the goods station at Newcastle-on-Tyne showed had actually been realised. Garbett summed the whole thing up by saying, "In Greece we have the architecture of the post and lintel, and in Rome we have the architecture of the arch, and there is no other constructive principle except that of the truss." In a building like the Vere-street Post Office they saw the truss employed on an enormous scale. There was a question of whether this reinforced concrete was known to the Romans, and he would suggest to the engineers that they should consider the subject of the cold-water bath of Caracalla in Rome. It was an enormous hall, and ancient writers told them that its ceiling was one of the marvels of Rome. It was flat, and had three or four large openings for lanterns. How did the Romans support a ceiling of that gigantic scale, flat, and with these openings in it? Professor Lanciani mentioned that when the cold-water bath was explored great quantities of T-irons were removed. The engineers might consider in what way with the aid of T-irons and concrete they could restore this wonderful roof of the Romans. There was no doubt that Roman construction was extraordinarily vast, and anyone who wandered about Palestine Hill and Hadrian's Villa and saw the great apses and wonderful vaults must come to the conclusion that the Romans had little to learn in this regard. He knew that the roof of the Pantheon had some extraordinary truss construction of flat bars of bronze. There was a sketch of it by Raphael, but the bronze was afterwards melted down. The Romans reinforced their concrete with quarry tiles, by which they counteracted the shrinkage and other defects of concrete. They had only one text-book on architecture descending from the Romans, and that was by Vitruvius. It was, however, the work of a provincial architect, who seemed to have copied what he might term the War Office specifications of the period. He held that there were some Roman specifications issued by the Army, because in every part of the world they found the Roman walls uniform. The secret of Roman concrete was to him absolutely unknown. He was very familiar with the Roman fortress known as Richborough Castle near Sandwich, which was still surrounded by a great Roman wall. The wall was 20 ft. high and 10 ft. thick, but when the railway was being built the barbarians destroyed the sea wall, and on the return wall they excavated a great opening which was high enough to walk under and was over 8 ft. in depth. The span of the opening was 50 ft., and yet this wall had remained in such a state for sixty years without the slightest sign of cracking. So far as one could see, the wall was constructed of nothing but the materials on the spot, and the mortar seemed to be ordinary chalk mortar. What was it, then, that the Romans mixed with the mortar to transform it into a material as hard as our Portland cement? When the Romans left the country, whatever used to be done to the mortar ceased to be done, for when the Normans attempted to do buildings of a Roman character they made a fearful mess of it. Turning to another aspect of the question, he thought in mica they had an opportunity of lighting up the surface of concrete, and there were also considerable opportunities by the use of acids in removing the excess of cement over certain portions. Professor Pite had rather omitted the Byzantine period, but it was in Byzantine times that Roman architecture found itself. Byzantine buildings were Roman buildings released from the bondage of the Orders. The whole question of shams was worth serious consideration, for, after all, in architecture the effect of beauty had to be attained.

Mr. E. P. Wells

considered there was no reason why the usual architectural methods should not be adopted in the treatment of concrete. It was artificial stone in the same way that brick was artificial material, and he could see no reason why it should not be moulded and treated in a proper manner so as to be pleasing to the eye.

* The paper was printed in the *Builder* for December 29 last.

Mr. E. Fiander Etchells
remarked that the problem had two sides; the first was whether they should consider ferro-concrete as a material which should be announced naked to the world. The second was whether they should deal with it only as a skeleton, and clothe it with some other material until the architects themselves decided into which category they would put it. He would express no opinion, especially as architects seemed to judge solely by their feelings, and feelings were unreliable things.

Mr. H. Shepherd
thought it was permissible to use joints in concrete, and suggested that the joint should be made where each day's work began. In one of the earliest examples of Greek art—the Colossus—they had a great wall made of unburned brick, which was plastered over, and in this was moulded large figures. That was a possible suggestion for the treatment of a ferro-concrete building.

Professor Pite,
in reply, said it was impossible to imagine a system of proportion for a new material apart from those ideas of proportion which they derived from others. The subject before them wanted study, but it could only be undertaken by a serious study of architecture.

THE YORK TOWER COLLAPSE.

IN the course of an inquest at York extending over six days into the death of Arthur Bowman, cabinet-maker, the victim of the collapse of a York clock-tower,

Mr. William Black, of Leeds, the district manager for the Trussed Concrete Steel Company, Ltd., said his firm did not undertake any responsibility for the material and workmanship of the ferro-concrete. He believed, however, the work was carried out in accordance with their plans and drawings. In a letter to the architect he referred to the necessity of a clerk of works to superintend the work, but he believed that on this job there was no clerk of works in the strict sense of the term. Witness said he was not aware till after the accident that one of the beams, known as R23, was not put in its proper place.

By Mr. Kay (for the architect, Mr. Monkman): He did not find any fault with the work which the contractors were doing.

By the Coroner: He accepted responsibility that the beams were strong enough to carry the tower if constructed of proper workmanship and material.

By Mr. Stewart Anderson (for Messrs. Sage): It would obviously have been better to have had a clerk of works.

Mr. Moritz Kahn, C.E., Managing Director of the Trussed Concrete Steel Company, Ltd., and inventor of the "Kahn" system, was the principal witness, and was under examination for several hours. He explained the operation of the strains and stresses on ferro-concrete work by a series of demonstrations on a blackboard and by means of models. He gave details of the design of the construction of the beams, and said they were originally asked to design for a tower weighing between 25 and 30 tons. This was afterwards altered to a weight of between 35 and 40 tons. They altered their plans, but accepted no responsibility, for a tower which weighed more than 40 tons, nor did they assume responsibility for the brick tower *per se*, and the details were never submitted to them.

Witness explained the details of the foundation beams for the tower, and showed by diagrams the stress to which they were to be submitted. He said that, as a matter of fact, the beams on which the tower rested would have required 155 tons dead weight to bring the beams down, whereas the tower only weighed about 38 tons. He had carefully examined the *débris* and found no evidence of failure by tension, compression, or shear. He concluded that the collapse was due to the shock of some load suddenly applied to a back beam. Whatever was the cause, it was something beyond the control of his firm. If the dome weighing 2 tons fell on to this beam it would give a shock equal to a dead load of 480 tons, "which would go through the beam like cheese."

Examined by the Coroner as to the allegation of the witness Porteous, the previous day, that a piece of wood was made up in the beam R22, witness said he had examined the beam, and there was no trace of it. Even if it had been left in it would not have been the cause of failure. Had that wood block anything to do with the tower coming down?—No. Witness also added that the two steel joists, which were used in place of the beam for the back, which had been misplaced, had nothing whatever to do with the cause of the accident.

Cross-examined by Mr. Kay (for the architect), witness said he believed the cause of the tower collapsing was the weakness of the walls, caused by the small brick arch round the clock dial, which was not properly bonded. It was a physical impossibility to bond the terra-cotta rings to the brickwork. The vertical joints in the terra-cotta were another cause of weakness. He believed, also, the cast-iron ring inside the dial would be a contributory cause to the weight of the tower. Witness added that in his view the tower was merely being held up by the strength of frozen lime mortar, and, owing to its design, was in a state of unequilibrium, which only required the slightest disturbance to bring it over. Dealing in detail with some parts of the design of the tower, he said he found at one corner stresses which were absolutely prohibitory in engineering designs.

By Mr. Black (for Messrs. Boyes): He usually designed buildings with a safety factor of 4, and the beams under the tower were designed to this factor. They were designed to carry 40 tons, and, therefore, their factor of safety would be 160 tons, and as a matter of fact he found that the breaking weight was about 155 tons.

By Mr. Camidge: He had built at least six hundred buildings and other works on his system in the last six years.

The Foreman: We think it would have been better for the firm to have had an experienced clerk of works.—That is beyond our control. It was a matter for the architect.

In answer to a juror, Mr. Kahn said his formula for the concrete was 4 gravel, 2 sand, 1 cement. He did not know some ferro-concrete firms used a proportion of only 1 of sand, but 4—2—1 was the standard formula of the Royal Institute of British Architects.

Mr. Frederick Rings, architect, surveyor, and civil engineer, London, was asked by the Coroner if he attributed the fall of the tower to superstructure under it, to the tower itself, or to the concrete construction. Witness said he thought the fall was caused by the failure of the two beams R24, which acted as cross-beams from the main beams at the front and back. This was due to the faulty design of the reinforced concrete.

In cross-examniation by Mr. Kahn, Mr. Rings admitted that he had made a mistake in his calculations as to the shearing stress, and in cross-examination by the Factory Inspector he said he acknowledged now that the beams were four times stronger than he anticipated in his first calculations, but he was still of opinion that the tower fell because the cross-beam R24 came away from the main beams on account of tension in the upper area of the cross-beam.

Mr. Geo. Fredk. Bowman, architect, Leeds, who had made an inspection of the building at the request of the Coroner, said in his opinion the material used in the concrete beams was sound and good, and complied with the formulæ of the Royal Institute of British Architects. In his view, if the tower had been carried out to the details in the bonding of the angles and to the specifications, which stated that the whole of the terra-cotta work should be filled with cement concrete and walled and jointed with cement mortar, it would have stood. The weakest part about the tower was the straight joints up the side of the pilasters. One of the weak points was the clock rim, which was not tied to the two half-brick rim arch at the back.

In reply to Mr. Newbald Kay (for the architect, Mr. Monkman), witness said Mr. Kahn's theories as to the cause of the accident given to him before his inspection had no weight with him in coming to his conclusions. There was no material difference between them. There was no evidence of the beams having failed, either by compression or tension. There was no sign of a stump or of shearing where the beams joined, but there was the fact that the concrete was good, and that the calculations showed that at those points it was very strong indeed. The beams running from front to back were fixed, but they took a dead weight, and were quite capable of carrying all that was upon them.

Mr. Alan Ruddle, architect, Peterborough, called by Mr. Camidge for Mr. Kahn, said he had examined the drawings and plans of the tower, and also the plan for the terra-cotta work. It was his fixed belief that the tower would not have stood for long. The whole of the weight of the superstructure must have been thrown on to the terra-cotta, which was practically unsupported by anything, and would tend to burst open.

The Coroner, in summing up, dealt with the various theories propounded to account for the disaster. He said the theory that the ferro-concrete work was defective in design and gave way was dependent on the proof that the props under the beams had been removed. The evidence of the contractors was that no props had been removed, and he thought probably the jury would come to the conclusion that the props had been confused with the removal of the side casings. As to the other theory that the tower fell first, he said it appeared to have been built rather quickly in wet weather and with lime mortar, and according to the evidence the mortar was not thoroughly set when the collapse took place. Most of the witnesses were agreed that it would have been better if built in cement. It also appeared that there was something not quite right about the centre of gravity. It was for the jury to say whether the variations in the terra-cotta work and not adhering to the specifications gravely weakened the structure, or was a cause contributing to its collapse, or whether it was due to being built in lime mortar in wet weather, or the effect of frost, or to being too quickly built, or whether it was due to all or any of these things, or to some other cause. It was for the jury to say what caused the tower and the under-structure to fall, and who, if anyone, was criminally responsible for that falling.

The jury were absent for an hour and a half, and on returning the foreman stated that they found that "Bowman died from shock as the result of injuries caused by the fall of the tower, but the evidence is so conflicting, and chiefly theoretical, that we are not able to say what caused the tower to fall." They added as a rider that "in our opinion it would have been better for all parties concerned had a fully qualified clerk of works been engaged."

[The above is abstracted from a full report which appeared in the *Yorkshire Post*.]

ENGINEERING NOTES.

The Institution of Civil Engineers.

THE following is an abstract of a paper by Mr. F. Shelford, B.Sc., entitled "Some Features of the West African Government Railways," read at the ordinary meeting of the Institution on Tuesday. A brief history of railway construction in the West African Colonies of Sierra Leone, Gold Coast, Southern Nigeria and Northern Nigeria is first given, and its effect upon the pacification of these countries and upon their revenues is described. The methods of surveying are then dealt with in detail and the difficulties met with in the clearing of forests are referred to, some description being given of the more important trees found and their uses. The method of constructing earthworks is dealt with, and the forms of pipes and culverts found most suitable for these tropical railways are referred to. Particulars of about forty of the more important bridges are given in tabular form, with general remarks upon the methods of erection employed; and the Carter and Denton Bridges at Lagos, aggregating 3,000 ft. in length, are described in some detail. The types of structures adopted for terminal and wayside stations, workshops, engine-sheds, coal-stores, carriage-sheds, wagon-repair shops, stores, bungalows, quarters, water-tanks, etc., are mentioned, and the permanent way and system of signalling are described. The paper concludes with particulars of the costs of construction and the results of working in the case of each colony. A brief reference is also made to the railway work carried out by France in her West African Colonies.

The Liverpool-street Tunnel.

THE engineers engaged in tunnelling for the extension of the Central London Railway from the Bank to Liverpool-street have completed the boring. The parties working from opposite directions—from the present terminus and from Liverpool-street—have effected a junction. The engineers' calculations were so accurate that the hole through which the working parties were able to speak was only 30 in. in diameter. It is expected that the extension, which is about half a mile in length, will be ready for traffic in June or July next.

THE BUILDING TRADE.

THE INSTITUTE OF BUILDERS: HOW TO CHEAPEN TRANSPORT.

THE following is the continuation of our abstract of the paper by Mr. A. W. Gattie recently read before the Institute of Builders and the London Master Builders' Association:—

"Speaking of the building trade, I imagine that the cost of transport must be quite 33 per cent. of the value of building materials generally; it is so of the most expensive forms of bricks and it is 100 per cent. of the cost of the cheaper bricks, when carried from Peterborough. If we can get our building material carried cheaper, the immediate result would be that we could build houses more cheaply, consequently there would be a larger demand for houses, and, while economic methods of transport would undoubtedly save labour and reduce employment per ton, they would increase the tonnage and also would provide labour in other directions. I know of no trade in which increased activity would boom the labour market more than activity in the building trade.

Perhaps I may here give two examples of transport of material, the first of which I have called the uneconomic and the second the economic. Let us suppose that it is necessary to carry 100,000 glazed bricks from Yorkshire to London, a distance of 200 miles. The weight of a glazed brick is exactly 6·75 lb., and therefore:—

100,000 of such bricks would weigh	301 tons
Each brick would carry under normal atmospheric conditions about 1 lb. of water, or a total of 44 tons of water	44 „
The total load to be carried would be therefore	345 „
This journey is now performed in fifty open trucks, each weighing in wet weather about 6·6 tons average, which gives a total tare weight, including the brake van, of	345 „
The total weight behind the engine is consequently	690 „
Normally these trucks would be returned to Yorkshire empty, involving the haulage of	345 „
Total tons hauled would be therefore	1,035 „

1,035 tons hauled 200 miles = 207,000 ton miles, representing 207,000 ton miles work done.

The time occupied in the journeys would be about 144 hours or more, at about 3 miles an hour average.

The time occupied in loading and unloading, 192 hours or more.

The total time occupied from start to finish would consequently be 336 hours or fourteen days.

The capital value of fifty trucks at 70*l.* apiece would be 3,500*l.*, and the occupation of railway space involved would be about 10,000 sq. ft. for fourteen days.

The total charge for railway haulage in railway companies' own trucks is 11s. 8d. per ton of freight for 200 miles.

345 tons of bricks at 11s. 8d. per ton = 48,300d. = 201*l.* 5s. 2d.

But, as we have seen, the haulage of the bricks is really only a part of the job; the bricks have been hauled 200 miles and the trucks have been hauled 400 miles. Therefore the actual work done for this money is 207,000 ton miles.

This charge gives the railway companies a gross earning of 0·23d. per ton mile, under a farthing, and that figure demonstrates the enormous value of the locomotive, which only absorbs a little over a quarter of this sum, or say 0·05d. per ton mile.

We now have to add to this cost of railway haulage the cost of handling and road haulage or carting. The net labour cost of packing 1,000 glazed bricks in straw, taken from the adjacent stack and put into the truck, would be 2s. 3d., exclusive of establishment charges. Quoting the labour at 6d. per hour, we therefore have a loading cost, into the railway trucks at the brick factory in Yorkshire of £11 5 0

The next handling is at the depôt in London, and consists of unloading from the truck to the stack, at the same rate, viz.:	11	5	0
Subsequently we have a third handling from the stack to the road cart, which with the carman's help, not here charged for, would amount to	5	7	6
The bricks now have to be carted to the job.			
The minimum charge for this cartage per thousand bricks is 4s. 6d. for a distance not exceeding 2 miles, and this sum includes waiting on arrival at the job, sometimes for hours, and helping the brickmakers' labourer to load the cart and the contractors' labourer at the job to unload the cart, 4s. 6d. per 1,000 on 100,000 bricks ..=	22	10	0
The labour in assisting the carman to unload and stack the bricks at the job at 2s. 3d. per 1,000 on 100,000 bricks .. ..=	5	7	6
Total cost of cartage and handling=	55	15	0
Which, added to cost of rail haulage	201	5	2
Gives us a grand total of £257	0	2	

The cost of these bricks, delivered in London would be 1,000*l.*, out of which the brick-makers would pay 251*l.* 2s. 8d. for transport, and the contractor would pay 5*l.* 7s. 6d. for unloading. This total of 257*l.* 0s. 2d. would amount to over 33 per cent. of the sale value of the bricks as stacked in Yorkshire.

We will now consider whether this work could be done more cheaply and without injury to any of the parties concerned.

Let us take the same load sent for the same distance, but on this occasion let it be sent in seven big truck loads, each carrying thirty skips, or 210 skips in all, there being an average of 476 bricks in a skip. The total load of these bricks would be, as before, 345 tons, including 44 tons of water, not easy to eliminate 345 tons

Add to this the weight of 210 skips at 1 cwt. apiece, say	11 „
Seven bogie trucks, weighing 25 tons each, and each measuring 50 ft. over all	175 „
The total weight behind the engine would be	531 „

instead of 691 tons estimated in the former example.

It must not, however, be forgotten that these skips would have to be returned to Yorkshire, and, in order to make this return journey as economic as possible, the skips are so constructed that they can be taken to pieces and packed together Chinese-puzzle fashion, so that a bundle of eight skips will occupy a cube of 41 in. These skips could easily be packed into one truck and not fill it. The full capacity of a truck having a platform of 48 ft. by 8 ft. would allow of 240 skips being placed upon it. However, we are only considering 210 skips as being the necessary work involved in the delivery of these particular 100,000 bricks, and the return journey therefore amounts to—

	11 tons of skips
and one truck weighing	25 tons
or	36 tons in all.

With regard to the remaining six bogie trucks, these would not be returned empty from the Clearing House unless at that time the Clearing House had no goods to send to Yorkshire, an extremely improbable contingency, as the Clearing House would represent the whole of the seventy-four existing goods stations of London, and would consequently have, on an average, seventy-four times as much to send away as any individual goods station. However, we will allow, for the sake of argument, that one of these six waggons had to be returned unloaded, and we then have to add 25 tons tare, to be carried unremuneratively to Yorkshire. We must therefore assume that the total tons hauled in performing this brick business would be 592 tons, which, carried for 200 miles, would amount to 118,400 ton miles. The time occupied by the journeys would be reduced on account of the reduced load behind the engine, and also because the bogie trucks would be fitted with continuous brakes which would admit of the train pulling up within a reasonable distance. The length of the train would be decreased to 350 ft., as from the length of a train of fifty trucks of 18 ft. each, or 900 ft. in all.

Fifty 18-ft. trucks would measure 900 ft., and seven 50-foot trucks would measure 350 ft. Putting the time of the journey of such at 20 hours, *i.e.*, 10 miles per hour, including stopping, the actual running time being at 20 miles an hour, we have:—

Seven trucks at 20 hours and one truck returned at 20 hours, or eight trucks occupied for 20 hours loading and unloading, say 4 hours' detention, altogether (3½ hours at the brickfield and half-hour at Clearing House), we have one day's use of eight trucks, capital value 500*l.* each .. .. =	£4,000	0	0
And, say, one month's detention of 210 skips, capital value 2*l.* each=	420	0	0
Occupation of railway space would be about 4,000 sq. ft. for one day.			
The total charge at current rates is, we know, 11s. 8d. per ton, which gives us	201	5	2
On 345 tons load, involving 207,000 ton miles work done, at 0·23 per ton mile.			
Allow the railway company the same rate per ton mile, the charge on 118,400 ton miles would be	113	9	1

In this manner it will be seen that on the item of railway haulage a saving of 87*l.* 15s. 10d. will be made out of an expenditure of 201*l.* 5s. 2d.

We will now leave the consideration of railway haulage and turn to the handling, storage, and cartage of these bricks on Clearing House principles. The original cost of packing the bricks in skips at the brick factory in Yorkshire would amount to the same as packing in trucks.

This operation would cost	£11	5	0
The cost of hoisting these 210 skips by crane, four at a time, into the railway waggons, would amount to about 2s. 6d., and perhaps occupy half an hour.			
Unloading these 210 skips by cranes at the Clearing House might occupy some ten minutes, and the cost per skip for either hoisting from the truck and lowering into the crypt for storage, or hoisting on to the road level and depositing on a road-car for direct delivery, may be put at 3d. per skip, inclusive Clearing House charge, or 6d. per skip including unloading the railway waggon, loading motor-car and storage ..	5	5	0
Total	16	10	0

Cartage by motor-car at 2s. 6d. per load of 1,000 bricks, for a distance not exceeding 2 miles, and including unloading at the job without assistance, by means of a special apparatus carried by the car	£12	10	0
Total loading, unloading, and cartage, and delivery at the job ..	29	0	0
which, added to cost of rail haulage	113	9	4
Gives a total cost of bringing bricks from Yorkshire to London within 2 miles of the Clearing House of..	142	9	4

instead of 257*l.* 0s. 2d., showing an economy of 114*l.* 10s. 10d., or a saving of about 45 per cent.

This, however, would only allow of delivery on a job within 2 miles from the Clearing House, and all jobs would not be within 2 miles of the Clearing House. I have been asked many times whether it would not be cheaper to have the bricks sent to the nearest station to the job than have them sent from the Clearing House. If it can be shown that it would be cheaper to send a consignment of bricks to any particular station in London, that could be very easily arranged at the Clearing House, as, for instance, we will assume that half a truck-load, that is, fifteen skips of bricks, need to be sent to Croydon, the skips would be put on to the first goods train leaving the Clearing House for Croydon, and on arrival at Croydon they could be very easily lifted off the train and deposited on any convenient spot without any delay, with the minimum of loading and unloading expense, and a suitable charge for haulage; but for any distance within 10 miles of the Clearing House it would be cheaper to carry the bricks by road direct, in Clearing House motor vehicles, carrying 1,000 bricks in two skips per load.

The class of brick I have been considering is the most expensive kind, and is, of course, not so much used as the common Fletton brick. When fairly dry, the Fletton brick weighs 5 lb. 4 oz., and easily absorbs 1 lb. of water, bringing its weight up to 6 lb. 4 oz. The cost of carrying 100,000 bricks from Peterborough, a distance of 76 miles, at 4s. per ton, would amount to 50*l.* By present methods this operation involves an engine haulage of 44,080 ton miles at a little over a farthing per ton mile. On Clearing House principles, the work done would amount to 34,884 ton miles, which, at the same rate, would be 39*l.* 4s. 10d., and you will thus see that, instead of making a 45 per cent. economy in this instance, we can only make an economy of 20 per cent., amounting to 10*l.* 15s. 2d. However, it must be remembered that the gross saving on Fletton bricks on a year's deliveries would be far larger than that of the happy gentleman who ships glazed bricks from Yorkshire. Fletton bricks are not handled with that delicacy and care which is bestowed upon glazed bricks, but the handling of them costs a considerable sum of money which I venture to put at 5s. per 1,000, which on 100,000 bricks would consequently be 25*l.*, and here again the Clearing House could effect an economy of 50 per cent. The total cost of carrying 100,000 Flettons from Peterborough to a job within 2 miles of the goods station to which they were taken would be 75*l.* By Clearing House methods, the work could be done for 52*l.*, making only an economy of 30 per cent. on the entire job. I think that these two examples are a very fair criterion of what could be achieved by Clearing House methods in the matter of building material.

If we compare the equipment of the Clearing House with its immense array of powerful apparatus with a goods station, such as Paddington or Bricklayers' Arms, we at once realise that the handling of steelwork or heavy timber could be carried out with modern apparatus, far more cheaply than with prehistoric. However, there is a point to which I should like to draw your attention. Modern apparatus costs money, and in order to use it to the very best advantage it must be kept busy, and the installation of the Clearing House would not be kept busy if it were reduplicated all over London. It would cost seventy-four times as much, if it were placed in all the goods stations, and it would be unremunerative, and it could not possibly discharge its function as a depôt of universal exchange. A dozen little Clearing Houses dotted about London could not possibly do the work of one big Clearing House. The great virtue of the Clearing House is that it is a system of unification. All vehicles inwards or outwards proceed on radiant routes. All vehicles starting from it carry goods from everywhere to everywhere and pass everywhere on the road, and all vehicles, either road or rail, going to the Clearing House bring goods from everywhere to everywhere and pass everywhere on the road.

Before leaving the subject of the handling of building material at the Clearing House, I would like to draw your attention to the fact that all transactions are carried on under cover, hence if a load of limestone is delivered at the Clearing House the transhipment of this would not need to be done in the wet, although a thunderstorm might be in full swing outside the Clearing House. The limestone would arrive in Clearing House skips and would be dealt with in similar manner to the bricks. I think most builders' foremen know very well that they may send for a truck-load of lime, and directly it is uncovered have to cover it again because it begins to rain. Sometimes this leads to considerable loss of time and money, and there are other circumstances when it is undesirable to unload goods in wet weather. This drawback would never happen in the Clearing House."

The lecturer then dealt with the handling of miscellaneous goods of all kinds.

SEVENTH MANCHESTER BUILDING TRADES EXHIBITION.

MR. CAWOOD presided at the Midland Hotel, Manchester, on the 15th inst., at a meeting of the exhibitors of the Seventh Manchester Building Trades Exhibition, which will be held at the City Exhibition Hall from March 5-16. The minutes of the last meeting were read, and it was pointed out that the dates of the exhibition, the band engaged, and other arrangements had been carried out as duly authorised by the exhibitors at the 1910 exhibition.

It was announced that Councillor S. W. Royse, J.P., Lord Mayor of Manchester, had consented to open the exhibition at twelve noon on March 5, and that Alderman J. R. Wilson, J.P., Chairman of the Manchester Improvements Committee and Town Planning Committee, had consented to take the chair upon that occasion. Resolutions dealing with the Reception Committee and the names of gentlemen to propose and second various votes of thanks were duly carried. It was announced that telephones at the special rate of 1*l.* (one pound) each could be affixed to the various exhibitors' stands, thus permitting the exhibitor to telephone from his own stand at the City Hall to his works. Another communication was as to the printed list showing the special railway facilities from towns within the radius of 100 miles of Manchester to the exhibition.

A number of other resolutions were passed, and suggestions were made of interest to exhibitors not only at this but at other building trades exhibitions far removed from Manchester.

It was generally agreed that the exhibitor had a right to have a voice in the management of exhibitions that he supported with time and money, and the Chairman was thanked for the manner in which he had given exhibitors the opportunity of taking part in the direction of exhibitions under his control.

The Chairman announced that more exhibitors had booked space this year than any previous exhibition, and that there was every prospect of a Seventh Manchester Building Trades Exhibition being a successful exhibition. Over seventy firms are now included in the list of exhibitors. An exhibitor drew the meeting's attention to the fact that local architects, surveyors, and builders were in sympathy with the City Hall Exhibition, which had been recognised for years as the building trades exhibition for the North of England.

STANDARD TIME RATES OF WAGES.

A REPORT has been issued on Standard Time Rates of Wages and Hours of Labour in the United Kingdom at January 1, 1912 [Cd. 6054], by the Labour Department. The information has been collated from statements issued by employers' and workmen's associations or collected by the Department from the officials of the associations. It is pointed out that the rates given in the report are not necessarily the rates actually predominant in each trade and district covered, several factors being necessary for consideration to determine these. In the building trades there are over 800 local agreements in operation regulating wages and hours and other conditions of labour. The statistics, generally, show that longer hours are worked where the lowest rates are paid.

In the building trades in the London district the wage paid to bricklayers, masons, carpenters, and joiners was 10½d. per hour, plumbers and plasterers 11d., painters 8½d. and 9d., and bricklayers', masons', and plasterers' labourers, 7d. Amongst the districts where the lowest rates are paid in these trades are Driffield, Boston, Ledbury, Market Drayton, Stratford-on-Avon, East Dereham, and Lynn. In these the rate for bricklayers is 7d. per hour, with the exception of East Dereham, where it is 6d. The rates for the other branches of the building trades in these towns are not fully stated, but show small variations where given. In the engineering trades the rates were fairly constant over general areas, though slightly lower rates were usually to be found in the less important centres.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

WE understand that the President, Mr. Dudley Bartlett, of Messrs. Perry & Co. (Bow), Ltd., is actively engaged in organising a theatrical performance at the Royal Court Theatre, Sloane-square, on Saturday, March 9, in aid of the funds of this Institution. The piece to be presented is Mr. George Bernard Shaw's "You Never Can Tell," and, as it will be interpreted by members of "The Strolling Players" Dramatic Society, an excellent evening's entertainment is assured. We should like particularly to draw the attention of our readers to this undertaking, as we feel very strongly that the Institution deserves the hearty support of all connected with the building trade in London. We all know how difficult it is to get people to interest themselves in charitable work of this sort; not because they are not in sympathy with the work, or do not want to put their hands in their pockets, but rather because there is a certain amount of personal trouble entailed in writing for tickets. Mr. Dudley Bartlett assures us that, with the very loyal and energetic support of the Committee of the Institution, he is confident that this difficulty can and will be overcome, and he will gratefully acknowledge any applications for seats. Tickets may be obtained from him at Tredegar Works, Bow, E.

GENERAL BUILDING NEWS.

BOTANICAL INSTITUTE.

Sir Aston Webb, R.A., is the architect for the Botanical Institute in Prince Consort-road. The building will form part of the Imperial College of Science and Technology. A remarkable feature will be the greenhouse-laboratory on the top floor, which Sir Aston Webb has evolved in consultation with the authorities.

GLASGOW BUILDING SCHEME.

The Glasgow City Improvements Committee have approved the adoption of plans prepared by the City Engineer, Mr. A. B. M'Donald, for the reconstruction of the Trongate-area, which was recently destroyed by fire. On the north side between Tontine-lane and High-street it is proposed to construct two blocks of buildings, of which the front one will have a floor area of 22,000 sq. ft., with shop floor and basement facing the Trongate, and five upper stories. The back block between Tontine-lane and several courts will have a floor area of 21,000 sq. ft. on the ground floor and four upper stories. The buildings are to be built as warehouses, and are so designed as either to serve one occupant or to be divisible into flats. They are to be fireproof throughout, and are to be provided with lifts for passengers and goods. The estimated cost of the new buildings is 25,150*l.*

NEW BUILDINGS ON THE EMBANKMENT.

Alterations are about to be carried out at the Charing-cross and Temple Stations of the District Railway on the Victoria-embankment. At Charing-cross the booking-hall and the entrances to the station are to be reconstructed, and above the booking-office is to be erected a large building of stone and red brick, which will have 140 rooms, and will be used either as an hotel or as offices. At the Temple Station there are to be various changes. The booking-office is to be rebuilt and enlarged, and a new entrance provided from the Embankment. Adjoining the booking-office and with entrances from the station and from the bottom of the steps leading to Norfolk-street will be a restaurant with a floor space of 5,000 sq. ft. It is also suggested that the flat roof, extending over the whole of the new building, should be used as an open-air

tea garden. This would have an area of 16,000 sq. ft., with a frontage to the Embankment of 280 ft. Mr. H. W. Ford is the architect for the work.

TRADE NEWS.

Our notice has been called to Pollock's patent reinforced wood-blocks for paving and flooring (also adaptable to other purposes). The blocks are built into sections of any convenient size at the mill or factory. It is claimed that the adoption of this method will reduce the time occupied in handling the material and the ultimate placing of the work to a minimum, the work being accurately prepared in advance from drawings. The sections may be straight-edged and grooved for tongueing, and can be so constructed as to be safely laid on the bare joisting like an ordinary floor-board, abolishing the necessity for a bed, and when used for road-paving (on a floated bottom) the usual grouting process could be dispensed with. Further information can be obtained from Mr. Pollock, 151, Hanover-buildings, Fair-street, Tooley-street, London, S.E.

The Yale No. 45 cylinder deadlocking night latch embodies a new method of combining the convenience of a spring bolt with the security of a dead bolt. The bolt is square-ended, and, when projected, cannot be pushed back by end pressure. When held in the retracted position by the stop its end is flush with the front of the lock and fills the bolt hole completely. When the door closes the two pivoted hooks in the strike are forced apart by the bolt, and then automatically close over it, thus securely locking the door. The hooks are so guarded as to make it impossible for them to be attacked through the door-stile or otherwise The action of this lock in closing is smooth and easy, thus making it suitable for use on doors equipped with door checks.

Under the direction of Mr. W. Inglis, architect, Glasgow, Boyle's latest patent "air-pump" ventilators have been applied to Coatdyke Church, Coatdyke, Scotland.

The Infectious Diseases Hospital, West Bromwich, is being supplied with Shorland's warm-air ventilating patent Manchester grates by Messrs. E. H. Shorland & Brother, Ltd., of Failsworth, Manchester.

APPLICATIONS UNDER LONDON BUILDING ACTS, 1894 to 1909.

At Tuesday's meeting of the London County Council the following applications under the London Building Acts were dealt with. (The names of the applicants are given in parentheses):—

Lines of Frontage and Projections.

Deptford.—Addition at the rear of No. 195, Grove-street, Deptford, to abut upon the southern side of Hanlon-street (Mr. L. Jacob).—Consent.

Kensington, North.—Retention of a greenhouse at the rear of No. 33, Wallingford-avenue, Kensington (Mr. B. Hamburger).—Consent.

Kensington, South.†—Covered way in front of No. 37, Victoria-road, Kensington (Mr. D. Wells for Mr. A. le Rossignol and Miss E. le Rossignol).—Refused.

Lewisham.—Five houses with porches and bargeboards on the eastern side of Siddons-road, Forest-hill (Mr. E. C. Christmas).—Consent.

Paddington, South.—Retention of a conservatory over the porch at the entrance to No. 4, Marlborough-gate, Bayswater-road (Mr. H. J. Edgar).—Consent.

Paddington, South.—Projecting illuminated sign in front of No. 2, Woodfield-crescent, Harrow-road, Paddington (Mr. J. Lawrance for Mr. C. Mickleburgh).—Consent.

Paddington, South.—Wood and glass screens to the sides of the entrance porch at No. 70, Inverness-terrace, Bayswater (Messrs. J. Vears & Co.).—Consent.

Wandsworth.—Buildings on the southern side of Melrose-road, Southfields (Messrs. A. W. Taylor & Co.).—Consent.

Westminster.—Shelter at the entrance to No. 12, Artillery-row, Westminster (Mr. W. V. Falkiner for the Army and Navy Co-operative Society, Ltd.).—Refused.

Width of Way.

Chelsea.—Building upon a site abutting upon Pavilion-road, Charlotte-street, and Cross-street, Chelsea (Mr. C. W. Stephens for Harrods' Stores, Ltd.).—Consent.

City of London.—Building across the eastern end of Cockerill's-buildings (Mr. W. Pamphilon).—Consent.

Rotherhithe.—Buildings on the southern side of Rotherhithe-street, Bermondsey (Mr. F. McLeod for the South Metropolitan Gas Company).—Consent.

Width of Way and Lines of Frontage.

Camberwell, North.—Building upon the site of No. 419, Old Kent-road, Camberwell (Mr. W. F. Young for Mr. P. F. R. Saillard).—Consent.

Islington, South.—Building at the rear of No. 503, Liverpool-road, Islington (Mr. H. Kenchington for Messrs. Headland & Son).—Consent.

Paddington, North.—Projecting teak sill in front of No. 4A, Charles-mews, Paddington (Mr. W. R. Phillips for Messrs. C. Rickards).—Consent.

Woolwich.—Two-story oriel window in front of No. 56, Beresford-street, Woolwich (Mr. R. J. Bolton).—Refused.

Line of Frontage, Space at Rear, and Projections.

Kensington, North.—House on the southern side of St. Quintin-avenue, Kensington, and the eastern side of Wallingford-avenue (Messrs. E. T. Daley & Son).—Consent.

Lines of Frontage and Construction.

Greenwich.—Addition to a coachhouse at the rear of No. 56, Shooters-hill-road (Messrs. Dyer, Son, & Hilton).—Consent.

Hampstead.—Temporary wood and iron building at No. 1A, Linstead-street, Hampstead (Mr. E. W. Steward).—Consent.

Holborn.—Iron and glass shelter at the entrance to the Chancery-lane tube railway-station, High Holborn (Mr. E. P. Grove for the Central London Railway Company).—Consent.

St. George, Hanover-square.—Temporary wood and iron building at the premises of the Motor Spirit Direct Supply Company, Ltd.—Consent.

Deviation from Certified Plans.

Peckham.—Rebuilding of No. 86, Rye-lane, Peckham (Mr. F. Nicholls for Messrs. Upson & Co.).—Consent.

St. George, Hanover-square.—Re-erection of No. 34, Three Kings-yard, Grosvenor-street, Westminster (Mr. F. W. Foster).—Consent.

Alteration of Buildings.

Westminster.—Additional story at No. 32, Old Queen-street, Westminster (Mr. P. H. Feilding for the Right Hon. Lord Lucas).—Consent.

Uniting of Buildings.

City of London.—Openings in a division wall and use of doors of special construction in lieu of iron doors on one side of such openings at Nos. 171, 172, and 173, Aldersgate-street, City (Mr. T. B. Whinney).—Consent.

Finsbury, Central.—Uniting of Nos. 80 and 82, Clerkenwell-road, Finsbury (Mr. F. Eiloart for Messrs. Butler & Crispe).—Consent.

Holborn.—Openings in the party walls at Nos. 100, 101, and 102, Hatton-garden, and Nos. 13, 14, and 15, Robin Hood-yard, Holborn (Mr. J. Sawyer for Mr. A. W. Gamage).—Refused.

Kensington, North.—Opening between Nos. 5 and 9, Colville-mansions, Talbot-road, Bayswater, at the first-floor level (Mr. J. M. Beveridge for the Hon. E. G. Strutt).—Consent.

Strand.—Uniting of Nos. 57 and 59, Regent-street, by openings at the second, third, and fourth floor levels (Messrs. Emden, Egan, & Co., for Messrs. Swan & Edgar, Ltd.).—Consent.

The recommendation marked † is contrary to the views of the Metropolitan Borough Council concerned.

PROJECTED NEW BUILDINGS IN THE PROVINCES.*

ASHFORD.—Technical institute, Elwick-road; Mr. F. W. Crook, Secretary, Education Committee, Kent County Council, Caxton House, Westminster, S.W.

Auchterless (Aberdeenshire).—Additions to school (1,800*l.*); Mr. W. L. Duncan, architect, Hall Hill House, Turiff, Aberdeenshire.

Audley (Stoke-on-Trent).—Schools (2,000*l.*); Messrs. Watkin & Adams, The Square, Burslem.

Banbury.—Tar distillery works, near Great Western Railway-station, for Messrs. Robinson Brothers. Additions to factory for Messrs. H. Stone & Sons, Ltd.

Banchory.—Additions to school; Messrs. Wilson & Walker, architects, 181A, Union-street, Aberdeen.

Barrow-in-Furness.—Six houses, etc., Bridgegate Estate (2,150*l.*); Mr. A. Race, Surveyor, Town Hall, Barrow.

Bedlington.—School (4,500*l.*); Mr. Tart Senton, builder, Delaval.

Benfieldside. — Hospital, Ritson's-road (10,000*l.*); Mr. J. J. Eltringham, architect, Blackhill.

Beverley.—Baths, Lord Roberts'-road; Mr. J. G. Smith, Surveyor, Town Hall, Beverley.

Blackpool. — Workshop, etc., Hull-street (2,700*l.*), for the Fylde Water Board.

Blyth.—Offices for Harbour Commissioners (6,000*l.*); Messrs. Cackitt & Burns Dick, architects, Grey-street, Newcastle.

Bolton.—Picture theatre (2,100*l.*); Mr. H. Booth, 42, Regent-street, Haslingden.

Bournemouth.—Vicarage (2,000*l.*); Mr. H. E. Hawker, architect, St. Peter's-chambers, Bournemouth. Alterations to Palmerston Hotel for Messrs. Whitbread & Co., Ltd.

Brechin.—Proposed baths (6,000*l.*); Mr. W. Eggie, Surveyor, Burgh Offices, Brechin.

Brinscall.—Weaving-shed (19,000*l.*); Messrs. Duxbury & Ward, architects, Blackburn.

Buxton (Derbyshire).—Extensions to pump-room; Mr. W. H. Grieves, Surveyor, Urban District Council Offices, Buxton.

Cardiff.—Buildings on site of old Town Hall (75,000*l.*) for the Co-operative Wholesale Society.

Carnarvon.—Infirmary (6,850*l.*); Mr. R. Jones, builder, Llanwndd.

Colebrook.—Vicarage; Messrs. E. H. Harbottle & Son, architects, County-chambers, Exeter.

Desborough (Northants). — Congregational church (3,500*l.*); Messrs. Sharman & Archer, architects, 3, Market-street, Wellingborough; Messrs. Hacksley Brothers, builders, 1, Regent-street, Wellingborough.

Dunfermline.—Offices, opposite Carnegie Library (7,500*l.*); Surveyor, Town Hall, Dunfermline Parish Council. Branch premises, New-row (7,000*l.*), for the Bank of Scotland.

Edinburgh.—Additions and alterations to Victoria Hospital for Consumption (2,000*l.*); Messrs. Sydney Mitchell & Wilson, architects, 13, Young-street, Edinburgh. Printing works, St. James's-square (10,000*l.*); Mr. C. H. Greig, architect, 6, York-place, Edinburgh. Mission hall for Nelson Bequest Trustees, Spittalfield-crescent (2,150*l.*); Messrs. Cousin, Ormiston, & Taylor, architects, 140, Princes-street, Edinburgh.

Exeter.—The estimate of Messrs. C. H. Hunt & Son, builders and contractors, High Wycombe, has been accepted for rebuilding of Exeter Station, Great Western Railway. Warehouse, High-street; Messrs. J. M. & A. J. Pinn, architects, Bedford-circus, Exeter.

Exmouth.—Café, bakeries, etc.; Mr. T. Abell, architect, Rolle-street, Exmouth; Messrs. T. Abell & Son, builders, Rolle-street, Exmouth.

Gateshead.—Lecture hall and Sunday-school (2,000*l.*); Mr. J. W. Taylor, architect, St. John-street, Newcastle.

Gloucester.—St. Catherine's Church (8,000*l.*); Mr. W. B. Wood, architect, Queen-street, Gloucester; Messrs. W. Byard & Son, builders, Queen-street, Gloucester. Extensions to Moreland's Match Factory (3,000*l.*); Mr. E. A. Pryer, 18, Clarence-street, Gloucester.

Grassington. — Weaving-shed: Mr. James Hartley, architect, Swadford-chambers, Skipton.

Greenock.—Picture theatre (1,800*l.*); Mr. C. A. Boswell, architect, 53, Bothwell-street, Glasgow.

Harwich. — Fire-station, Wellington-street; Mr. H. Ditcham, Surveyor, Harwich Town Council.

Haslingden.—Additions to Messrs. Tattersall's Mill, Grave-road (2,184*l.*); Mr. W. Tattersall, architect, Market-place, Haslingden.

Hawick.—Swimming-baths (3,000*l.*); Mr. A. Inglis, architect, 12, North Bridge-street, Hawick.

Highgate, N.B.—Lodging-house (2,200*l.*); Messrs. John Melvin & Son, architects, 64, Mar-street, Alloa.

Keighley.—Extensions to baths (5,000*l.*); Messrs. J. B. Bailey & Sons, architects, Scott-street, Keighley.

Larne.—Extensions to fever hospital (550*l.*); Mr. A. M'Neill, builder, Larne.

Lochcarron.—Additions to parish church, also manse and offices (1,850*l.*); Messrs. A. Ross & Son, Queensgate, Inverness.

Lochness.—Church (3,000*l.*): Messrs. George Gordon & Co., architects, 6, Queensgate-street, Inverness.

Montrose.—Slaughter-house (2,500*l.*); Mr. S. L. Christie, Surveyor, Town Hall, Montrose.

Otley.—Underground conveniences, Market-place; Mr. C. F. Hodgson, Surveyor, Urban District Council Offices, Otley.

Paxton.—Manse buildings (2,000*l.*); Messrs. J. Stevenson & Son, architects, 14, North-terrace, Berwick-on-Tweed.

Peasedown St. John (near Bath).—School; Mr. W. F. Bird, architect, Midsomer Norton.

* See also our list of Competitions, Contracts, etc., on another page.

THE ROYAL ACADEMY LECTURES:

ITALIAN DRAUGHTSMEN OF XVIITH AND XVIIITH CENTURIES, AND PIRANESI.

THE fourth and concluding lecture of the present series of Royal Academy lectures on "Architectural Draughtsmanship" was delivered by Professor Reginald Blomfield, A.R.A., on the 15th inst., the subject being "Some Italian Draughtsmen of the XVIIth and XVIIIth Centuries, and Piranesi."

Professor Blomfield said that one man dominated architectural draughtsmanship in the XVIIIth century—*i.e.*, Giovanni Battista Piranesi, who stood apart from his predecessors and contemporaries. But however transcendant his achievements, whatever degree of perfection such a man may ultimately reach, careful study would always show that he is the child of his age, and that his genius is shown not least in the advance that he makes along a path already trodden by his predecessors. It was necessary, therefore, to pick up again the threads of Italian draughtsmanship at the end of the XVIth century. In the year 1589 Domenico Fontana, the well-known architect of Sixtus V., brought out a folio of illustrations of the means by which he had moved and set up the great Obelisk of the Vatican, generally known as the Guglia, in the piazza of St. Pietro. It was evidently the work of a draughtsman and engraver of a higher order than those who had worked for Serlio and Palladio. Fontana was perhaps the first to feel that fascination of scaffolding on which a well-known modern artist had played so skilfully. The book set up a new standard of architectural presentation, a method far ahead of the summary, though suggestive, wood-cuts of Palladio. The next stage was to abandon the formal method of Fontana's plates and to introduce sky and landscape in combination with architecture, a freer perspective, and more suggestion of the atmosphere and of light and shade. There were plates in Giovanni Battista Falda's famous "Fontane di Roma" in which the architecture is in correct perspective, and his figures and landscapes were excellent.

To Fontana had succeeded Carlo Maderno, Bernini Borromini, and Rainaldi, clever men in their exuberant and unscrupulous way, but not great architects or draughtsmen. Bernini was far the most considerable figure among the artists of the two middle quarters of the XVIIth century. His word was law in France as well as in Italy until the revolt of the French architects over the additions to the Louvre; and probably no artist had ever obtained a position of such unquestioned supremacy. But Bernini was from the first a sculptor, and a sculptor who, almost by instinct, rebelled against all restraint; and, though he did a great deal of architecture, some of it in a way of first-rate importance, he never looked at things from the standpoint of an architect, and was one of the most conspicuous offenders among that not inconsiderable class of artists who had regarded architecture only as so much stage scenery. He felt his way to vaguely realised efforts, and this failure, both in his training and in his habit of mind, was apparent in such of his architectural drawings as he (the lecturer) had come across. The passion for dramatic effect, always latent in the Italian, began to assert itself in the XVIIth century with ever-increasing insistency, until it finally overpowered their sense of architecture and substituted mere stage effects for that grave and serious art. There were still able architects, but Italian architecture was on the wane, and the slip-shod architectural drawings of Bernini and Borromini were evidence of its failure. Unless a man was a fine draughtsman it was almost impossible for him to be a fine architect. He did not mean that an architect was to devote himself to turning out magnificent drawings; far from it; he had greater work to do. Rather, by a severe gymnastic of drawing he should have trained his eye to the subtleties of form and composition, and his hand to interpret his ideas without hesitation and failure. Great painters did not parade their draughtsmanship, but it was implicit in their work. So, too, was it with architects; their draughtsmanship was shown in its highest form, not only in the beauty of their profiles, but in the scale, proportion, and composition of their buildings. But these qualities were only to be reached and fully realised through the assiduous study of great examples of the past, by means of which the architect accumulates a wealth of realised ideas in the background of his own imagination, trains his eye to seize at a glance the essential qualities of design, and his hand to interpret his conception without those mischances and blunders which lie in wait for the incompetent draughtsman. The purely technical drawings (*i.e.*, working drawings) made by such men as Bernini and Borromini were inferior to the drawings of Bramante, Peruzzi, and the two Sangallo, and it was evident that they were not real masters of this branch of their art, but were fumbling about for a motive in the hope of coming on it unawares in the tangle and confusion of their tentative lines. On the other hand, their dexterity in putting in figures and details of rococo ornament was amazing.

The lecturer then referred to the topographical work of Canaletto and his school, and the theatrical designs of the Bibiena family. The R.I.B.A. possess thirty-one original drawings of Giuseppi Galli Bibiena, most of which show an astonishing ability in draughtsmanship and mastery of perspective. But Bibiena was an artist of rather commonplace instincts and narrow range, and his archæology was simply absurd.

Piranesi, who was born at Venice in 1720, derived his fondness for composition of ruins from Ricci and Pannini. He was a draughtsman pure and simple, and not a painter. His earliest plates were issued in 1741, but his first serious publication of Roman antiquities and triumphal arches did not appear till 1748, followed by the "Carcere d'Invenzione" in 1750; and in 1751 his collected works up to date were published by Bouchard in a vast folio, entitled "Le Magnificenze di Roma le piu Remarcabili"—a miscellaneous collection carefully arranged, but splendidly printed on thick paper with noble margins—perhaps the finest publication of architectural drawings that has ever yet been produced. The "Antichita Romane," in four volumes, containing 216 plates, appeared in 1756, and was first dedicated to Lord Charlemont, but Piranesi considered his attitude so ungenerous that he removed his name and afterwards dedicated the work to Robert Adam. In 1761 Piranesi, who now described himself as "Fellow of the Society of Antiquaries of London," brought out his huge volume of "The Magnificence of the Architecture of Rome," in which he gave at great length his views of the origin of Roman architecture, and used his extraordinary ability as an etcher to demonstrate his quite erroneous argument. The "Diverse maniere d'adornare i Cammini," etc., appeared in 1769, and the "Vasi, Candelabri," etc., in 1778, the year of his death.

Piranesi's temperament was so complex and turbulent that he was a man of many manners, and the problem of disentangling these was made the more difficult by the fact that for years after his death his son continued to issue his father's plates with modifications of his own, and plates of his own from his father's drawings, just sufficiently like to be confused with his father's work by careless observers. Piranesi's art work is contained in Bouchard's folio. He did an abundance of work after that date, much of it very accomplished, but finish and elaboration took the place of the tense emotion that lay concealed beneath the surface of the wonderful plates that he made in the ten years before 1750. Even in his most restrained manner he could do wonders in the way of suggesting texture and reflected lights. Nor was his success merely technical. In nearly all his plates he succeeded in conveying an impression of that great scale, and of the magnificence of the buildings of ancient Rome, which from first to last were the predominant motives of his work, and became with him almost an obsession. He had a power of imparting to all he did a certain epic quality, some feeling of an heroic age long past that haunted his imagination, even to the tainting of its sanity. No one had ever approached Piranesi in his power of drawing architecture, though he was not a practical designer at all.

REPAYMENT OF LOANS FOR WOOD-BLOCK PAVING.

The Improved Wood Pavement Company, Ltd., have received the following letter from the Local Government Board:—"I am directed by the Local Government Board to advert to your letter of the 6th instant, and to state that they are now prepared to allow a period of ten years for the repayment of loans sanctioned by them for soft wood creosoted block paving."

THE CARPENTERS' HALL LECTURES:

THE SCULPTOR'S CRAFT.

THE fourth of the present series of Carpenters' Hall lectures on "The Arts Connected with Building" was delivered on Wednesday last week by Mr. T. Stirling Lee in the Hall of the Company, London-wall, the Rev. C. B. Bartlett, Past-Master, presiding.

Mr. Stirling Lee, the title of whose lecture was "The Sculptor's Craft, with demonstrations and lantern views," said he had brought his studio with him, and he intended to take the craft side of sculpture. But there were one or two things he had to say, and the first was that we have lost sight at the present day of the fact that sculpture is a language. Ruskin had well put it that the history of a nation was written in three books—*i.e.*, the book of its deeds, the book of its words, and the book of its arts; all three were necessary to complete history, but the only reliable one is the history of a nation's arts. That was very true, for the arts were and could be only an expression of time—*i.e.*, the work an artist was commissioned to do, and in the works of art we saw in exhibitions we got a very good idea of the ideals of nations. Sculpture was written history; it spoke a language. Before men could read and write, when they wanted to express their thoughts they did so by means of representations of things they saw, and the earliest art was drawing on bones—drawings of animals, because the artists were hunters. This went on until the people got ideals, and we got symbolism—symbolic language. So all through the ages sculpture was a record of man's thoughts—his ideals and aspirations and the history of nations. We were told by physiologists that very few of us use all the parts of our brain, and that was very true in regard to the arts. Man had in his brain the faculty, the sense of form, which had to be controlled by his intelligence; and so without the sense of form and colour governed by ideals, without the use of the intelligent part of his brain an artist became sensuous and degenerate. We all had this faculty of form and colour, this joy-giving sense, and the highest of all senses—*i.e.*, the sense of feeling, and a nation which did not develop these senses of form and feeling was only half living and was cutting away the joy of life. Nations which did not encourage the arts were swept from the face of the earth, and those which had, had handed down to posterity the greatest of riches the world had known. If we did not develop this side of our national life we lost one of the greatest channels of joy to the world. The nation which did not encourage art was like a man who went through the world blind because his eyes were not open to the beauty of it.

As to the evolution of these things, take language; what was at first figurative was now phonetic. When the phonetic language got to the printed language, the first and great use of the figurative language ceased to be, and so printing had more or less replaced or displaced the figurative language. No longer did people want their bibles written on walls of their public buildings, for they had their books, and printing had displaced the use of decorative language, though it could never destroy that part of man which had the faculty of form. Those who had that faculty were the producers or lovers of it as long as man existed.

There were two essentials which governed the sculptor's work, and like every other art it must have its scientific basis. Art began where science ended, and there were the two sides to sculpture work—*i.e.*, the science of the human form, anatomy, and the science of geometry; and all through the ages different artists were governed more by one science than the other. If the sculptor was plastic, or a modeller, anatomy would assert itself in his work; if he was glyptic or a carver, the geometrical side would govern his work. And the reason was that the clayworker builds up his work and the carver carves down, and he (the lecturer) proposed to show them how the sculptor built up the clay, and also how the carver cuts his marble.

The lecturer, with a small clay model of a man before him, proceeded with pliable clay to build up, on a movable lead pipe or skeleton stand, the beginning of a figure, bit by bit. He explained that every line must flow into every other line and harmonise right through. Every line should have some meaning, and there must be no stop anywhere in the flowing lines of the work. He also showed the geometrical method of carving in distinction to the anatomical science, and remarked that directly sculpture was divorced from architecture it became academic and purely clay, for in sculpture related to architecture the mason's side had to prevail, and the reason why a great deal of sculpture never harmonised with architecture was because it was purely plastic.

The lecturer described some of the sculptor's tools and then showed some lantern slides of beautiful sculpture work.

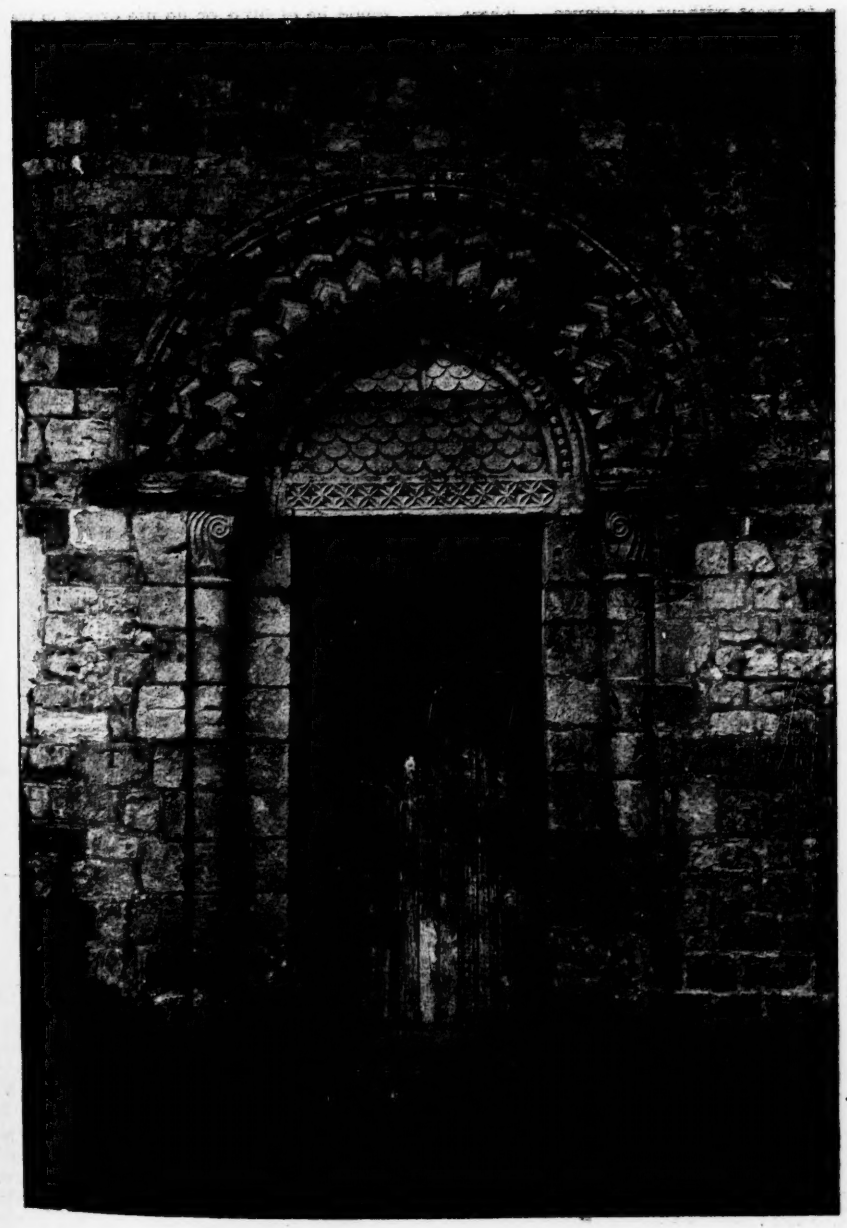
BOOKS.

Memorials of Old Gloucestershire. Edited by P. H. DITCHFIELD, M.A. With many illustrations. Demy 8vo. (London : George Allen & Co., Ruskin House, Rathbone-place. 15s. net.)

THIS is another of that excellent series of the memorials of the counties of England and has been edited by the general Editor, who has produced in this volume an admirable addition to the numerous volumes of the series already published, and has given a comprehensive review of the chief treasures of historic interest and antiquity of the shire. Of special interest are the accounts of the treasures of mediæval and ecclesiastical art that are to be found within the county, "the curious fonts, the Norman doorways with their quaint sculptures, the carved woodwork of the misericords, the bells that sound in minster and in church, the unique stained glass of the Fairford windows." The Editor contributes a chapter on historic Gloucestershire; Mr. E. A. B. Barnard on Winchcombe and Sudeley Castle; Miss M. Phillips Perry on the misericords of Bristol Cathedral; Canon Carbonel, M.A., on the Fairfax windows; and the Rev. Canon Bazeley, M.A., on Berkeley Castle, and an exceptionally able essay on the Norman doorways of the county is contributed by Mr. C. E. Keyser, M.A., F.S.A., accompanied by a unique set of plates illustrating the doorways and showing how rich in beautiful work of the kind Gloucester is. We are able to illustrate one of the doorways. The volume is worth possessing if only for this essay and the accompanying plates, but other interesting articles needing special reference are "Chipping Campden and Its Craftsmanship," by Mr. C. R. Ashbee, F.R.I.B.A., and "Gloucestershire Fonts," by Dr. A. C. Fryer. The article on the city of Gloucester, by Mr. J. Sawyer, contains illustrations of some of Mr. W. Leighton's drawings. We welcome another of these excellent "Memorials."

Everybody's Guide to the National Insurance Act, 1911. By THOMAS SMITH, Barrister-at-Law. (London : Chas. Knight & Co., Ltd., 227-239, Tooley-street, S.E. Price 1s. net.)

A GOOD many attempts have been made to explain this important and far-reaching measure, and such is its complexity that there is great need for a guide which will explain to everybody—or, certainly, to the great mass of the citizens who are, or will be, seeking for knowledge—what the Act means and how far they are affected by its provisions. The Bill as introduced was subsequently altered so much that even if the work of the Parliamentary draughtsman left nothing to be desired, the public might well be excused if they failed to understand to the full this new piece of legislation. The book before us is a non-political work, and the author has done much to explain the Act and make its meaning clear. The Act is arranged in sections, showing the effect on every class, so that anyone is at once in the position, on reading the book, to find how the new law affects him or her, as the case may be, and what steps it will be necessary to take to obtain the benefits which the Act affords.



South Doorway, Pauntley Church, Gloucestershire.
(From "Memorials of Old Gloucestershire.")

Laxton's Builders' Price Book for 1912. Originally compiled by William Laxton. Ninety-fifth Edition. (London : Kelly's Directories, Ltd., 182, 183, and 184, High Holborn, W.C.)

Lockwood's Builder's, Architect's, Contractor's, and Engineer's Price Book for 1912. Edited by FRANCIS T. W. MILLER, A.R.I.B.A. (London : Crosby Lockwood & Son, 7, Stationers' Hall-court, Ludgate-hill, E.C.)

IN dealing with these two works our remarks apply almost, if not quite, equally to both. Both are excellent in their way, and that way is almost identical. True, Laxton occupies the premier place, but that is principally on account of age, but although it can boast its ninety-fifth year there is no indication of senile decay. It is quite possible that the advent of the younger brother accounted to a large extent for the rejuvenation of the elder. The 1912 edition is quite up-to-date in the best sense of the word.

We have carefully gone through both, and find that the necessary revision has been carefully done, and it is a good sign that more revision has been necessary for this year than for some time past. There are curious little discrepancies in both in the calculations for cost of brickwork, and it is also strange that one allows 4s. per rod and the other 5s. per rod for scaffolding, while there is a difference of over 12 per cent. in the prices of labour only. But we must conclude that they are, after all, only consistent with the variations of prices shown in the bills of builders tendering for work. Whether it will ever be possible to standardise even such a definite matter as the pricing of brickwork is a very open question.

On page 354 of Laxton we would point out what is obviously a printer's error. Milled lead in sheets is priced at 1*l.* 11s. 6d.; this should surely be 1*l.* 1s. 6d. This is borne out by the subsequent prices for lead and labour. It, however, is some satisfaction to know that, notwithstanding a careful examination of the work, this is the only real error that we have traced.

Again we have pleasure in praising both works for their thoroughness and care in production with the reservations we have so often mentioned before—the difficulty of really supplying a standard—and which is emphasised by the references we have given. We could give many more did space allow.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. Edward White, Chairman, presiding.

LOAN.—The Finance Committee recommended, and it was agreed, to make a loan of 20,200*l.* to the Westminster City Council for the purpose of obtaining through communication from Great Marlborough-street to Noel-street.

SCHOOL SHELTER.—It is proposed to erect a small shelter in the boys' playground at the All Saints' School, Putney Bridge-road.

SOUTHERN HIGH LEVEL SEWER.—In connexion with the construction of the Southern High Level Sewer No. 2, a local sewer in Ivydale-road, Nunhead, is to be connected with the Southern Sewer at a cost of about 185*l.*

NEW STORE.—A permanent store is to be erected at the Barking outfall works at an estimated cost of 350*l.*

THEATRES, ETC.—The following drawings have been approved by the Committee :—226, Commercial-road (Yiddish Theatre)—arrangement of the safety curtain, arrangement of electrical switchboards, battens, ventilation, etc.; Down-place, Hammersmith (cinematograph hall)—formation of exitway; Hotel Cecil, Strand—electrical arrangements for the winter garden; Queen's Hall, High-street, Peckham—enlargement of the entrance vestibule; Royal Academy of Music—sundry minor alterations, lighting and mechanical arrangements; Upper Tooting-road and Fircroft-road (cinematograph hall)—adaptation for use as an office of a shop on the side of the entrance vestibule.

NEW BUILDINGS.—It is also proposed to erect a new dining hall at the Imperial Hotel, Russell-square, and a new cinematograph hall is to be erected at 234, Pentonville-road, N.

COTTAGES AT WALLSEND-ON-TYNE.

THE cottages illustrated on this page represent a type of domestic architecture that is rapidly coming into favour in the district with people who require a house of moderate accommodation and cost. They are planned so that the principal rooms face south, with the portico, hall, and out offices north. The brick-paved paths make a pleasant feature to the interior porches, which are also paved in bricks.

TRAFFIC REPORT OF THE BOARD OF TRADE.

ONCE again the London Traffic Branch of the Board of Trade calls attention to the stupendous nature of the traffic problem. We rise from a study of the fourth Annual Report with an overwhelming sense of the vastness and intricacy of the subject and of its vital importance to the welfare of London. Whatever preconceived ideas we may have had on the subject of town planning, this Report does bring home to us with irresistible force the fact that the traffic practically governs everything, and, in the present state of London, is the one subject that most requires immediate attention.

The Royal Commission on London Traffic, which reported in 1905, found that the difficulties of the traffic were largely due to the narrowness of the streets and to the lack of any general comprehensive plan, and suggested an investigation into the adequacy of the main arterial roads.

In consequence of this suggestion, an inquiry was begun by the Traffic Branch in 1909, further results of which are now published continuing those already published in 1910. Some excellent maps are included in the appendices to this Report, showing, in addition to other information, the volume and nature of the traffic on the main roads and bridges leading out of London.

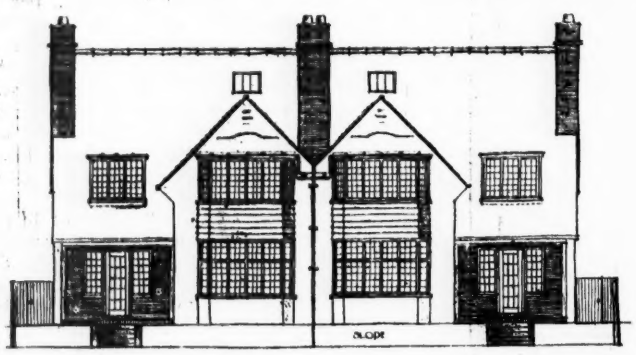
It is perhaps not too much to say that this problem of the arterial roads is the most important of all, or, at any rate, the one most in need of immediate attention, in view of the preparation of town-planning schemes now being taken in hand by various local authorities within the radius of Greater London.

It is obvious that such local schemes should be brought into proper relation to and form part of a general scheme. But as this Report points out, although the publication of last year's Report lead to inquiries from local authorities, yet

"From the point of view of the local authorities, there are two main difficulties in adopting the scheme. The first is the absence of such assurance that a proposed road will be carried through from end to end, as would justify a particular authority in undertaking the construction of an isolated section. The second arises from the likelihood of claims being made for compensation in respect of land over and above the statutory width which should be reserved in order to secure a minimum of 100 ft.—claims which a local authority might be unable or unwilling to meet without assistance. There is, however, reason to hope that where new roads would greatly benefit their estates, owners of large properties would be willing to give the additional width on favourable terms, if not free of cost, where satisfied that the roads would be completed throughout. It will, moreover, often happen that the line of a proposed new road runs through an area which, being already developed, cannot be included in any town-planning scheme. The construction of such a section might involve the purchase and demolition of buildings, entailing expense, which no local authority could face unassisted even if—as would seldom be the case—the road, when constructed, would be of greater benefit to the district than to places further afield. There are also cases in which a proposed line traverses open country not yet ripe for development. Here, again, although the construction of such sections would not be costly, and extra land could easily be reserved, it is hardly to be expected that rural district councils would be prepared to incur the expense out of their own limited resources.

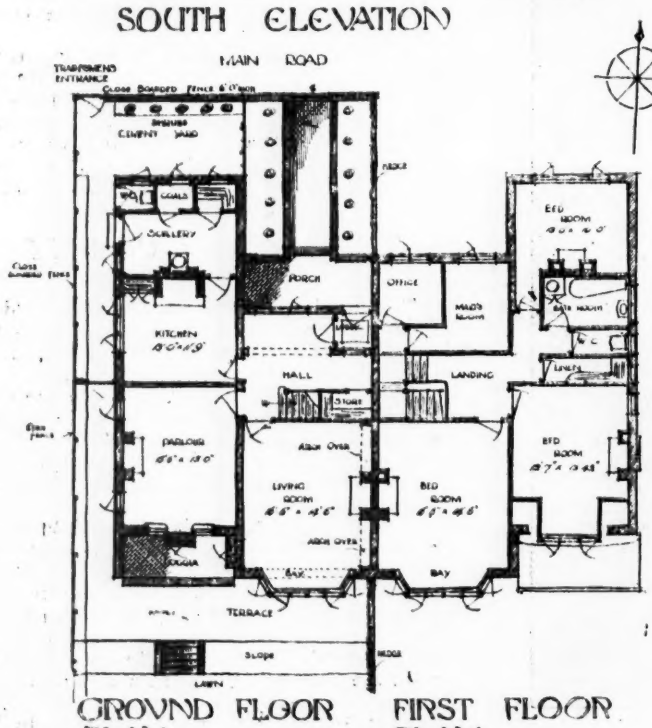
As joint action is clearly indispensable to success, it would seem to be desirable that some central authority should be charged with the duty of conferring with the county councils, local authorities, landowners, and others, with a view to arrive at a common agreement both as to the precise line to be adopted, and as to the apportionment of the cost. A settlement of this kind would be facilitated if the inducement of assistance from public funds could be held out in cases such as those already referred to. Public money, which could properly be allotted to the improvement of traffic facilities in the metropolitan district, using the term in a wide sense, could undoubtedly be laid out to far greater advantage in procuring the construction of roads in the outskirts, where the value of property is rising, buildings are multiplying, and delay would add each year to the cost of improvements, rather than in fully developed districts nearer the centre, where the cost of improvements would be little, if at all, greater a few years hence than it would be now.

If local authorities and private owners were encouraged to adopt approved lines, in connexion with town-planning schemes, by giving assistance from public funds towards the expense of constructing connecting sections, it might be found that the formation of many miles of arterial road could be secured at a moderate cost. Roads which will have to be made in any case for local purposes, could be so laid out as to meet the requirements of arterial communication, and if suitable lines were adopted from the first, it would rarely be difficult to bring the schemes into conformity with them without any sacrifice of local convenience. Town-planning roads, on the other hand, laid out independently, without reference to a general scheme, so far from assisting it, might actually stand in its way, and would be of little or no use except to the localities concerned. It is therefore suggested that attention should be directed to this question without loss of time, not only with a view to secure the early provision of improved communications which are so urgently required, but also to obtain for the community the best value for their money."



SOUTH ELEVATION

NORTH ELEVATION



GROUND FLOOR PLAN

FIRST FLOOR PLAN

EAST ELEVATION

PAIR OF COTTAGES WALLSEND ON TYNE

SCALE OF FEET

Cottages at Wallsend-on-Tyne. Mr. Edward Cratney, Architect.

Although the general conclusions of the Traffic Branch seem eminently reasonable, and the necessity for new or widened arterial roads proved up to the hilt, there is another aspect of the question which, we think, must not be lost sight of. Where a road is congested there seems to be two ways of dealing with it—either widen the road or reduce the amount of the traffic. In a town that has grown to such an enormous and unwieldy size without any definite plan, it appears evident that the lack of any proper dispositions of its various trades in relation to one another or to the railway centres creates an enormous amount of traffic which is, strictly speaking, unnecessary, or rather would be so if the life of the town was better organised. Even as things are at present, the arguments for a general Clearing House for goods supports the contention that much of our present traffic is quite unnecessary and that a better organisation would result in a great relief to the streets.

The suggestion naturally presents itself that the two aspects of the question should be studied together with a view to the suppression of unnecessary traffic where possible before heavy expense is incurred in widening. Indeed, in some cases where the cost of widening a congested road or of creating a relief road is altogether prohibitive, this seems the only hope left to us.

There is much to be done in the same direction by the better organisation of the distribution of goods and by the better regulation of the traffic generally. Such, for instance, is the proposal for an underground railway for the conveyance of mails, which would take 1,000 Post Office motor-vans off the streets which now perform 5,000 to 6,000 daily services. The Report notes the relief which would be thus afforded, particularly if the system were extended to the general distribution of goods, but, of course, still further relief would be gained if the distributing centres were properly placed.

To obtain a proper basis for the production of such a general scheme for London as is imperatively required it is obvious that a general survey of the life of London and an exhaustive inquiry into the whole of its arrangements will be necessary. Such a colossal undertaking could probably only be handled by those possessing the authority and resources of a Government department.

In pursuit of data on which to found its suggestions for new or improved roads the Traffic Branch has collected much valuable information as to the recent growth, density, and migration of the population, as well as to its probable growth in the future. The most striking fact in this connexion is that for the first time in more than a hundred years the population of the administrative county has begun to decline. The increase in the outer ring is greater than ever, while beyond the outer ring considerable increases have taken place in many localities up to 30 miles or more from the centre.

It is impossible within the limits of a review to do justice to the immense amount of information contained in this Report. It deals not only with population and arterial roads, but with street improvements, bridges and tunnels, public carriages, tramways, railways, steamboats, strikes, and the regulation of traffic, to which is added a memorandum by the Home Office. Numerous appendices give exhaustive statistics on all these subjects, and the eight maps which accompany it are by no means the least valuable part of the report which should be studied by all interested in the subject. To the student of town planning it is a mine of information and suggestion.

LEGAL COLUMN.

Obstruction to Light.

In a recent case, Griffith *v.* Richard Clay & Sons, Ltd., the defendants admitted obstruction to certain ancient lights, and the plaintiff, having waived his claim to an injunction, the sole question for the Court was the assessment of damages.

The plaintiff's premises comprised two dwelling-houses let at weekly rentals and a warehouse at the back. The district was no longer residential, and the buildings were very old, and would soon have to be demolished. Only the lights of the dwelling-houses appear to have been obstructed, and the question was raised whether in assessing the damages only the site value of the dwelling-houses was to be considered or the site value of the whole area. The Court adopted the latter view.

Mistake at an Auction.

A curious point in connexion with an estate sale has recently been raised in one of the County Courts. The vendor had placed a reserve upon one of the lots to be sold by auction of 375*l.*, but by an oversight it had been entered in the auctioneer's sheet at 170*l.* The mistake was discovered during the bidding, but the lot was knocked down at 170*l.* before the auctioneer became aware of it. The plaintiff in the action was the purchaser, who was claiming specific performance of the contract against the vendor. The plaintiff contended that this was not an auction subject to a reserve price, because the fact was not specifically stated, although certain sale conditions were incorporated which did contain such a condition.

The Judge found that the plaintiff knew that the sale was subject to reserve, and therefore had sufficient notice. The Court decided that the plaintiff could not claim specific performance of an agreement which, if entered into at all, was made through a slip or mistake on the part of the vendor's agent unaccompanied by gross negligence, and judgment was entered for the defendant.

When a sale is subject to a reserve price, and the fact is known, it has been held by the Court of Appeal that the offer of the auctioneer to sell, the bidding, and the knocking down of the article to the highest bidder, are all subject to the condition that the reserve price shall be reached, and the bidder has no right of action against the auctioneer either for breach of duty in refusing to sign a memorandum or otherwise to complete the contract, or for breach of warranty of authority to accept the bid (McManus *v.* Fortescue, 1907, 2 K.B., 1).

In another case, Rainbow *v.* Hawkins (1904), where an auctioneer had inadvertently knocked down a pony without reserve, and immediately on discovering his mistake put it up again, the Divisional Court held that the action against the auctioneer failed because no memorandum of the sale had been made. These are both cases where the action was brought against the auctioneer, not as in the present case, where the action was brought against the vendor; but in the latter case it was intimated that as an auctioneer has an implied authority to sell without reserve, unless that limitation is brought to the notice of the purchaser, the purchaser would have a right of action against the vendor if a memorandum of sale existed.

LAW REPORTS.

Right to Injunction in an Ancient Light and Air Case.

In the House of Lords on Thursday, the 15th inst., Lords Macnaghten, Atkinson, Shaw, and Robson disposed of an appeal brought by Mr. H. M. Cockerill against an order of the Court of Appeal in favour of the respondents, the Middlesbrough Co-operative Society, Ltd.

Mr. Tindal Atkinson, K.C., and Mr. Edward Shortt, K.C., instructed by Messrs. Tatham & Lousada for Messrs. Faber, Fawcett, & Faber, Stockton-on-Tees, appeared in support of the appeal; Mr. Waugh, K.C., and Mr. J. A. Slater, instructed by Messrs. Griffith & Gardiner, for Mr. M. W. Hutchinson, of Middlesbrough, for the respondent Society.

Mr. Atkinson, in opening the case, said the plaintiff owned some cottages close to where the buildings of the defendant Society were erected, and he brought his action at Leeds in March, 1910, to recover damages for obstructing the access of light and air to his premises by the erection on the defendants' adjoining land of a warehouse and other buildings, and for nuisance and for breach of an agreement alleged to have been entered into between the parties in the previous April. Further, he claimed an injunction to restrain the defendants allowing the new buildings to remain in such a condition as to diminish his light and air, otherwise than as agreed. The defendants denied there was any such nuisance as the plaintiff alleged.

At the trial, the jury, by consent, were discharged, Mr. Justice Ridley agreeing to the request of the parties that there should be a report on the premises made by Mr. G. T. Brown, of Sunderland, who should answer certain questions framed as the basis on which he should make his report, and that he should find what damages (if any) the plaintiff had sustained by reason of the alleged breach of the agreement, if it was found by him that the common law rights of the plaintiff had not been infringed.

In his report he found that the plaintiff had suffered no damage.

The question whether in these circumstances the plaintiff was entitled to a mandatory injunction was reserved for further argument before the same Judge in London. The short point of law was this:—

The plaintiff said that the substance of the agreement was that the defendants would not so erect the warehouse to such a height as would obstruct his ancient lights, and that the roof should be, by arrangement between the plaintiff and the defendants' architect, pitched as low as practicable. The roof was pitched at 34° 4′. The plaintiff alleged that a pitch of 30° (a degree more or less to be considered immaterial) alone satisfied the words "as low as practicable."

Mr. Justice Ridley, in giving judgment, declined to treat the arrangement to be come to as to the pitch of the roof as a negative covenant, and therefore refused to grant an injunction.

Lord Macnaghten: Why do you say the learned Judge was wrong? Surely it is a matter of discretion.

Mr. Atkinson said it was not a matter of discretion. In 1868 Lord Cairns, in delivering judgment in Doherty *v.* Allen, three Appeal Cases at p. 719, where he was dealing with a covenant to repair a building, and the remedies and rights of the parties under that covenant said:—"If the parties, for valuable consideration, with their eyes open contract that a particular thing shall not be done, all that a Court of Equity has to do is to say, by way of injunction, that, which the parties have already said by way of covenant, that the thing shall not be done; and in such case the injunction does nothing more than give the sanction of the process of the Court to that which already is the contract between the parties."

Lord Atkinson: You contend that if a man says, "I agree to pitch the roof as low as practicable," it is equivalent to his saying, "I will not pitch the roof higher than it is absolutely necessary."

Mr. Atkinson: My submission is that where it is found that the parties agreed that there should be an undertaking given by one not to do a thing a particular way, and there is a breach of that negative covenant, the other party as of right can claim an injunction.

Lord Atkinson: But there was no agreement that the roof should be pitched at a certain degree.

Mr. Atkinson: No. There was an agreement that it should be pitched as low as possible. There was no evidence that the plaintiff knew that the respondents were building the roof in such a way as to be a breach of their negative undertaking, or that he knew or could have known the height or pitch of the roof until it was completed.

Mr. Shortt followed on the same side, without hearing Counsel for the respondent.

Lord Macnaghten said that in this case the Court of Appeal had affirmed a decision of Mr. Justice Ridley, who had refused, in his discretion, to grant a mandatory injunction. In his opinion, that decision was right. It seemed to him that the Court of Appeal, where elaborate judgments had been delivered, had treated the question raised with too much ceremony. It was not necessary for him to trouble the House with the facts in order that they might pass their judgment on whether this undertaking amounted to a negative covenant, which on the authority of Doherty *v.* Allen should be enforced by mandatory injunction. Whether on the facts disclosed an injunction should be granted was a matter of discretion for the Judge. Mr. Justice Ridley had refused to grant an injunction. It was perfectly clear that no damages had in fact been sustained by the plaintiff, and therefore he should merely move that the appeal be dismissed with the usual consequences.

The other noble and learned Lords concurred.

Order accordingly.

Euston-Road Building Line: High Court Application.

On Friday, February 9, before a Divisional Court of the King's Bench Division, composed of Justices Hamilton and Lush, Mr. Daldy applied *ex parte* on behalf of the London County Council for a *rule nisi* to the Tribunal of Appeal under the London Building Act to show cause why they should not state a case for the opinion of the Court.

Counsel said that under the Act the determination of the general line of buildings in any particular street or part of the street was in the first instance carried out by the

Surveyor and the Superintending Architect, but against that certificate the Act gave an appeal—which was an appeal both on facts and law—to what was known as the Tribunal of Appeal. From that Tribunal there was an appeal by way of a case stated on questions of law to that Court.

His present application had regard to a difficulty that had arisen in respect to Euston-road. There was the certificate of an architect as to the general line of the buildings in a certain part of Euston-road, and there was an appeal to the Tribunal of Appeal in connexion with which many people appeared.

There were originally five appellants, and there were interested parties who were also called. The Tribunal decided the case in a certain way, and there was an application for a case or cases to be stated. The Tribunal took the view that there were five different proceedings before them, in each of which they ought to give a separate determination and state separate cases. The question for their Lordships was whether there ought to be one or more cases. There were now three appellants only, said Counsel.

Mr. Justice Hamilton: Do you say the Tribunal propose to state three cases?

Counsel: Yes. We ask that there should be one case stated, to which all the parties who appeared before the Tribunal of Appeal should be named.

Mr. Justice Hamilton: If there were three cases raising the same point, I take it they would all be in the paper together, and judgment would not be given until they had been argued, and the three respondents would be heard separately.

Mr. Daldy said that the London County Council would be the respondents in every case here, and with three cases it would amount to a very considerable quantity of litigation. He agreed with what Mr. Justice Hamilton had said with regard to each party having the right to a separate case; but, as his Lordship was probably aware, the House of Lords had decided that the determination of the position of the building line was not the determination as between the Superintending Architect and any particular party who had a house along that line of building, so that it might be left open to a party having a different house to get another determination.

Mr. Justice Hamilton: Is there any divergence in the arguments of these different appellants?

Counsel replied that he believed that with one slight exception their contentions were practically the same.

Mr. Daldy proceeded to quote legal sections dealing with the determination of the general line of buildings in streets and the provisions concerning the stating of a case for the opinion of the High Court on questions of law, and said he submitted that a local authority or anybody who had a grievance might go before the Tribunal of Appeal, and any party interested could also go before them and be heard. The Tribunal of Appeal had to state a case for the opinion of the High Court on any question of law involved in any appeal submitted to them.

Mr. Justice Hamilton said he saw the Tribunal of Appeal had given an elaborate statement as to its refusal to comply with Counsel's wishes, and it was stated that it would be difficult to consolidate the points of law and facts in one combined case, and it might create hardship, whereas it was simple to state in three cases, and they thought that would be more conducive to justice being done.

Counsel, in further reply to the Court, said that originally there were five parties who gave notice to appeal, and the London County Council were the respondents.

Mr. Justice Lush: Then the Tribunal of Appeal might not, by their decision, satisfy the appellants or the respondents?

Counsel said that in this case the Tribunal of Appeal had "broke out" with a judgment which was unexpected by the parties concerned. The Superintending Architect had defined the general line of buildings along a certain part of the Euston-road, and the whole discussion was with reference to that length in which the particular line was situated. The Tribunal of Appeal rightly or wrongly divided it into three, and defined building lines in three different parts of the street. Something was decided by the Tribunal which neither of the parties had asked for.

Counsel added later that if the rule were granted it would have to be served on the appellants and notice given to the parties interested. There were appellants as to the middle part, and as to the west end the Metropolitan Railway Company would be made respondents and the London County Council would be made appellants.

Ultimately, after further discussion, the rule was granted.

KING'S BENCH DIVISION.

(Before Mr. Justice COLERIDGE and a Special Jury.)

Padbury *v.* Holliday & Greenwood, Ltd., and Others.

IN this case Mr. Alfred Goulton Padbury, of 64, Brownlow-road, N., claimed damages for personal injuries from Messrs. Holliday & Greenwood, Ltd., builders and contractors, of Loughborough Park, Brixton. The action involved an interesting question in regard to liability for an accident on January 4, 1910, and the defence embodied a general denial of such liability.

Messrs. Holliday & Greenwood had been erecting premises at the corner of Fenchurch-street and Lime-street in January of last year, and Messrs. Wainwright & Waring, of Chiswick, as sub-contractors, were engaged to fix in casements for the windows. Plaintiff passed the building on January 4, and was struck by an iron cramp that fell on his head and rendered him unconscious. He was taken to the hospital on an ambulance, and now told the Court what he had suffered in consequence of the accident. His right side, he said, was partially paralysed for a time; loss of memory since the accident had necessitated the use of a dictionary when writing letters; he was unable to resume work for over eight months, and now had to wear glasses when writing or reading. His doctors did not think he would ever be "the same man again."

Mr. Wainwright, director of Messrs. Wainwright & Waring, Ltd., gave evidence in support of the claim. He said his company were originally coupled as defendants to the action, but as against them the case was discontinued.

Mr. Spencer Bower, K.C. (for Messrs. Holliday & Greenwood): How did it come to be discontinued?

Mr. Wainwright: By the plaintiff's solicitor seeing me. I gave him an account of our position in the matter, and the terms of our sub-contract.

Witness added that when his company tendered to supply the window casements it was understood that they should have the use of the defendant's scaffolding, etc.

It was urged, on behalf of the defendants, that they were not responsible for the accident, inasmuch as it was caused by an employee of a sub-contractor letting the iron cramp drop. Mr. Spencer Bower submitted that there was no evidence of liability as against Messrs. Holliday & Greenwood. The sub-contractors, he said, were in control of the third floor, from which the cramp fell, and, he argued, plaintiff could not rely upon any alleged contractual relations between the builders and sub-contractors.

Mr. Benjamin Greenwood, a director of the defendant company, stated, in evidence, that they had no voice in the selection of Messrs. Wainwright & Waring, and they had nothing whatever to do with the erection and supply of the window casements. While the defendants' men were erecting the building all reasonable precautions were taken to guard against accidents; but after the building was roofed in the scaffolding, etc., was removed in the usual way. They were under no obligation to take precautionary measures in connexion with the work executed by Messrs. Wainwright & Waring.

The jury eventually awarded Mr. Padbury 500*l.* damages, and his Lordship granted the defendants a conditional stay of execution with a view to the possibility of an appeal.

KING'S BENCH DIVISION.

(Before Mr. Justice AVORY and a Common Jury.)

Personal Injury: Chapman *v.* Greenwood, Ltd.

THIS was an action by Mr. James Chapman against Messrs. Greenwood, Ltd., builders, of Arthur-street West, to recover damages for personal injuries.

Mr. McCall, K.C. (for the plaintiff), said Mr. Chapman was injured in St. John-street, Clerkenwell, last May, by a brick falling on his head while he was passing a house where employees of the defendant company were at work. The bruise on the plaintiff's head was so serious that he was unable to work for sixteen weeks. His wages were previously 28s. a week, and since the accident he had only been able to earn 6s. or 7s. a week. In addition to his loss of wages, the plaintiff had incurred out-of-pocket expenses, including medical attendance, to the amount of 30*l.* 16s.

Mr. James Chapman, the plaintiff, a man twenty-four years of age, living with his father off the Goswell-road, gave evidence confirming the statement of Counsel. He said that while passing 423, St. John-street, on his way home to dinner, a brick fell upon his head, causing him to be dazed for a while. He fell against a hoarding, and a man, whom he took to be the foreman, came out and said he was sorry, giving him 1s. for some brandy, and asking to be informed if anything serious happened.

The defendants did not dispute liability, but questioned the amount of damages claimed, which, it was said, was out of proportion to the injuries sustained. In support of this contention witnesses were called.

Eventually the jury awarded Mr. Chapman 87*l.* 12s., including doctor's fees, and judgment was entered accordingly. His Lordship ordered that 25*l.* paid into Court by the defendants should be paid out to the plaintiff.

LONDON COUNCILS.

Bermondsey.—Plans have been passed for Messrs. Joseph & Smithem, architects, 83, Queen-street, E.C., for the erection of a building abutting upon Essex-place.

Fulham.—A plot of land adjoining Shell Wharf is to be leased to the Asiatic Petroleum Company, Ltd., on which the company propose erecting stables. Mr. A. Dawkins, on behalf of Mr. R. B. Mason, has had plans passed for the erection of twenty-three houses on the northern side of Clancarty-road, and six houses on the eastern side of Peterborough-road.

Hackney.—The Public Libraries Committee have decided to invite Mr. E. Cooper, F.R.I.B.A., to prepare plans, specifications, etc., for the erection of a branch library at Northwold-road and one at Brooksby's Wharf; also to appoint him architect to supervise the erection of the buildings at 5 per cent. on the cost of each of the buildings.

Hanwell.—The Surveyor has been instructed to prepare plans for open-air baths on the lower portion of the Churchfields, opposite Warncliffe-viaduct.

Poplar.—A plan has been passed for Messrs. J. Chessum & Sons for the erection of additions to the Poplar Hospital.

Watford.—At the last meeting of the Urban District Council the tender of Messrs. A. C. Potter & Co., Borough, S.E., at 4,967*l.*, was accepted for the construction of a well and boreholes in connexion with the Council's new waterworks scheme. Plans have been passed for Messrs. Bracey & Clark for three houses, Ashby-road, also for Messrs. Barker & Son, for alterations to a part of the frontage line in High-street.

West Ham.—The following plans have been passed:—Messrs. J. Chessum & Sons, extensions to offices at Messrs. Jenson & Nicholson's premises, Warton-road, Stratford; Messrs. W. Gladding & Co., showroom at Messrs. R. Ingram, Clark, & Co.'s premises, Abbey-road, West Ham; Mr. P. Tree, offices, stores, etc., at West Ham Chemical Works, Canning-road, West Ham; Mr. R. Living, warehouse, etc., at Messrs. Jeyes' premises, Richmond-street, Plaistow; Mr. J. R. Moore-Smith, workshops, etc., at the Gas Lighting Improvement Company's premises, Crow's-road, West Ham. Plans have been lodged by Mr. A. Monk for an extension to the cinematograph hall at the corner of Beckton-road and New Barn-street, Canning Town, also by Mr. H. Brickell, for extensions to bakery, Plymouth-road, Canning Town. The Education Committee have approved plans submitted by the architect:—(1) For the erection of a school for mentally and physically defective children on a site in Knox-road, estimated cost, 6,500*l.*: (2) new school adjoining Freemasons-road Recreation Ground, 23,250*l.*: (3) enlargement of the Harold-road handicraft centre, 350*l.*: (4) enlargement of the Water-lane handicraft centre, 300*l.*; and (5) new handicraft centre, Upton-lane School, 900*l.*

OBITUARY.

Mr. T. M. Rickman.

We briefly announced the death of Mr. Thomas Miller Rickman, whose funeral took place at Finchley on the 14th inst., in our last issue. The funeral was attended by many relatives and friends, as well as by members of societies to which he belonged. We have received the following additional remarks from one of the pupils and assistants of the deceased:—

"Practising as an architect till the early sixties, he found the real field for his genius in the profession of quantity surveyor, which practice he carried on till within a few years of his decease at the ripe age of eighty-four. There is perhaps no man living who did so much for his profession, which he carried to the highest standard. The very large number of pupils and assistants, many of whom are

now in practice, bear testimony to his wonderful ability. Past-President of the Surveyors' Institution, Past-President of the Architectural Association, A.R.I.B.A., A.M.Inst.C.E., F.S.A., etc., his great personality and genius commended itself to all who knew him. He has outlived most of his *confrères*, but we feel that a good man has passed away. He was so conscientious, upright, and high-minded. His father's "Gothic Architecture" is still a standard work. His great practice was most intimately associated with the late Mr. Alfred Waterhouse and many other architects of the late Victorian era. To enumerate, therefore, the public buildings with which he was so closely connected would need a column in itself. This, we feel sure, would not be pleasing to him, and we can only say that colleges at Oxford and Cambridge, Manchester, and Leeds, public schools, hospitals, and other institutions may know something of the great genius, whose abilities were by no means confined to his profession, who has gone from our midst."

PATENTS.

APPLICATIONS PUBLISHED.*

4,766 of 1911.—William Toombs: Construction of fireproof floors, ceilings, and roofs.

5,975 of 1911.—Percy Lyttelton Liney: Means for pulling up or raising floor-boards and the like.

6,813 of 1911.—Charles Foster Kite and Matthew Henry Skelt: Hot-water circulating systems.

7,577 of 1911.—Jacob Bredel and Otto Fromme: Silencing device for interposing in water supply pipes.

10,464 of 1911: Thomas William Twyford: Means for attaching the seats of water-closets.

13,012 of 1911.—Frederick Garben: Hoisting apparatus.

15,982 of 1911.—Eugene Humblot and Maurice Hureau: Implement for cutting holes in the ground for posts and the like.

16,715 of 1911.—Bertram Imrie Hellyer and William George Gooch: Lavatory basins, sinks, and the like.

18,434 of 1911.—Charles William Donholt: Faucets and valves.

22,108 of 1911.—Thompson Naylor: Means or method of reinforcing concrete.

23,336 of 1911.—George Armor Fair: Ventilators.

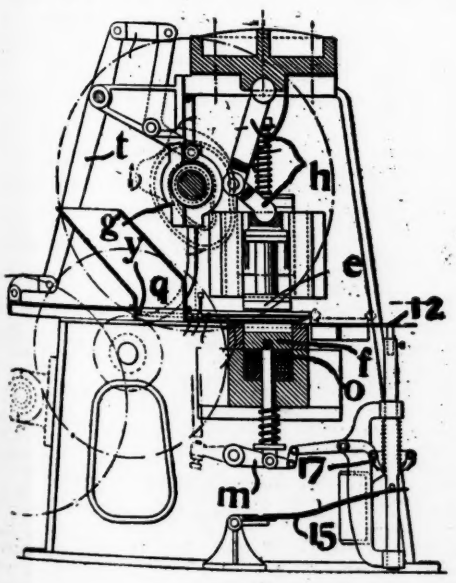
62,836 of 1911.—Ambrose Temples: Conveying-apparatus.

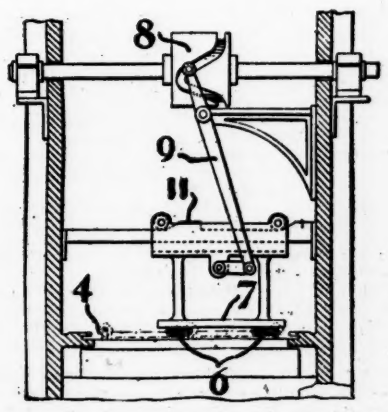
SELECTED PATENTS.

14,661 of 1910.—Conrad Dressler: Moulding tiles.

This relates to tile-presses having upper and lower pressing-plungers *e*, *f*, wherein the upper plungers are depressed several times in succession by means of a cam *g* having projections engaging with toggles *h*, so as to impart a series of compressions and free the material completely from air. The plungers are normally retained by springs, and excessive pressure is prevented by a spring device consisting of two sets of circular dished washers *o*. Material is fed into the moulds by a feed-box *q*, which is reciprocated by lever mechanism *t* actuated by a cam. The bottom plungers are elevated to discharge the moulded tiles by means of levers *m* operated by a cam-actuated rod. An extension of the feed-box *q* engages with the discharged tiles, and pushes them forward to a bur-removing device comprising gauze-covered frames 4, past which the tiles are pushed, and transverse gauze devices 6 mounted upon a frame 7, which is reciprocated by a cam 8 and lever 9, being normally elevated upon cam-surfaces 11. The finished tiles pass to a receiving table 12, supported by a spring 15, which is successively depressed to receive a pile of tiles by means of a ratchet 17 operated by the lever *m*.

*All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

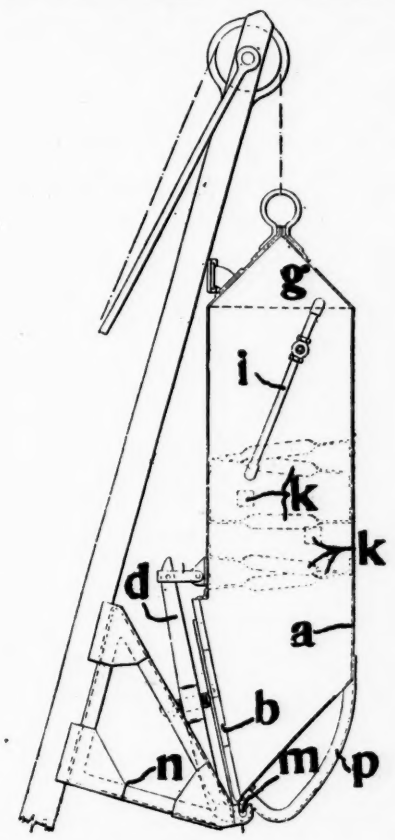




14,661 of 1910.

20,149 of 1910.—John Wulstan Twinberrow: Mixing concrete.

This relates to an apparatus for mixing concrete in which the materials are placed in a container adapted to be removed by a crane to the place required, the container being also agitated to mix the materials by means of the crane, which apparatus is provided with trunnions on the container adapted to enter supports to allow the container to be reciprocated. The container *a* is provided with cross-bars *k* for mixing the material, a charging-opening *b* provided with a tightly-fitting cover held in place by a lever *d* and link, and trunnions *m* which can be caused to engage with supports in a bracket *n* attached to the jib of the crane. One end of the container is formed as a water vessel *g* communicating with the remainder by a pipe *i*. To the lower end of the container are attached pieces *p* so formed as to ensure the container falling on its back when lowered on to the ground.



20,149 of 1910.

21,316 of 1910.—James Henry MacDonald: Concrete paving.

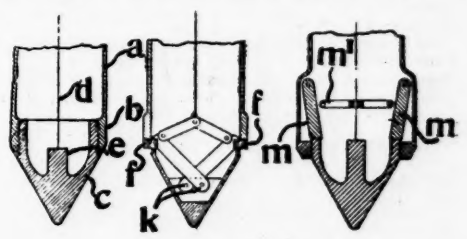
This relates to a reinforcement to be entirely embedded in the concrete for concrete paving, which reinforcement consists of two vertical series of sheet-metal bands intersecting it right angles and stamped with openings; the skeleton is laid directly on a prepared bed.

22,659 of 1910.—Matthew Parry and Douglas Stuart Gladstone: Ventilation chimneys.

This relates to a system for improving the ventilation and chimney draught in dwelling-houses, which comprises outlet bends and ducts placed near the ceilings of the apartments, and other bends placed in the four sides of the stack so as to catch the wind. Caps of wire gauze are placed over the bends.

22,695 of 1910.—Moritz Kahn: Piles.

This relates to a preparatory hollow pile which is provided with a detachable shoe and means for withdrawing the shoe through the pile. The shoe, *c*, is screwed into the preparatory pile *a*, and has a square neck *e*. When the driving operations are complete, a tubular spanner is used to screw the shoe into the pile, until the screw-threads are disengaged when the shoe is raised by the chain *d* or by spring pawls on the spanner. In another form segmental levers are mounted on links pivoted at *k* to the shoe and attached to the lifting-chain. The tube is slightly raised so that, upon pulling the chain, the flanges *f* are moved inwards clear of the tube when the shoe is ready for removal. The tube may carry pawls *m*, which bear on the shoe during driving operations, but are moved out of the way by a ring m^1 when the operations are complete so as to enable the shoe to be drawn up.



22,695 of 1910.

TRADE CATALOGUES.

We have received from Messrs. Benham & Sons, Ltd., of Wigmore-street, W., a booklet describing their "Perfect" system of hot-water heating for buildings, and pointing out the special advantages carried by the system. Briefly stated, the method adopted is to place a circulating pump on the return main close to the boiler, the pump being operated by a small electric or other motor, as may be most convenient. One effect is to accelerate the flow of water throughout the entire installation, replacing the slow movement due to gravity by a rapid circulation, which distributes heat generated in the boiler in a most efficient manner. Other beneficial effects are:—(1) That the main and branch circulation pipes can be reduced to about half the diameter of those requisite in a gravity apparatus; and (2) that the boiler can be placed at any level instead of having to be fixed in a basement or in a chamber excavated for the purpose. Naturally, the smaller pipes are less costly and do not cause the disfigurement hitherto so common. Moreover, the cost of installing pipes and the boiler is considerably reduced. The new system is one which we have pleasure and confidence in commending to the attention of architects and others interested.

We have received from the old-established firm of Messrs. Francis Morton & Co., Ltd., of Garston, Liverpool, and 27, Victoria-street, London, their latest net price-list for wrought-iron and wire fencing, railing, gates, etc. In the course of their seventy-odd years' experience the firm have executed numerous orders for many of the largest railway companies, corporations, land owners, and gentry in the United Kingdom and abroad, and they are, in addition, large manufacturers of steel bridges and girders, and steel constructional work generally.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. **Those with an asterisk (*) are advertised in this number:** Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointment, xviii.; Auction Sales, xxiv.

Certain conditions beyond those given in the following information are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

*** It must be understood that the following paragraphs are printed as news, and not as advertisements; and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.

Competitions.

MARCH 9. — **London, E.C.** — NEW OFFICES.—The Port of London Authority invite preliminary sketch designs for new head offices in Trinity-square, and for laying out remainder of land as a building site. See advertisement in issue of November 24 for further particulars.

MARCH 15. — **Drammen, Norway.**—RAILWAY-STATION.—Particulars from the Norges Statsbaner, Christiania.

MARCH 15. — **Prestatyn, North Wales.** — LAYING-OUT ESTATE.—Lord Aberconway and the Trustees of the Prestatyn Estate invite designs for laying-out of the estate. Three premiums are offered. Particulars from 33, Henrietta-street, W.C. See advertisement in issue of January 5 for further particulars.

MARCH 16. — **Harrow.** — PUBLIC OFFICES.—The Harrow-on-the-Hill U.D.C. invite tenders for the enlargement of and alterations to their Public Offices. See advertisement in issue of January 5 for further particulars.

MARCH 25.—**Colchester.** SCHOOL.—Limited to architects practising in the borough.

MARCH 30.—**Edinburgh.**—MEMORIAL TO KING EDWARD.—Limited. See Competition News, p. 151, February 9.

MARCH 31.—**Manitoba, Canada.**—PARLIAMENT BUILDINGS.—The Government of Manitoba invite designs for the new Parliament buildings to be erected in the City of Winnipeg. See advertisement in issue of February 9 for further particulars.

* APRIL 4.—**Portland.**—COUNCIL OFFICES.—The Portland U.D.C. invite competitive designs for Council Offices. Premiums of 50*l.* and 10*l.* are offered. See advertisement in this issue for further particulars.

APRIL 20.—**Birmingham.**—BLUE COAT SCHOOL.—Limited to local architects. Assessors, Mr. G. H. Hunt, F.R.I.B.A., and Mr. C. E. Bateman, F.R.I.B.A. Particulars from the Secretary, the Blue Coat School, Birmingham.

MAY 1.—**Rhos Ruabon.**—PAIR OF WORKMEN'S COTTAGES.—Premiums of 10*l.* and 5*l.* Assessor, Mr. Raymond Unwin, F.R.I.B.A.

MAY 1.—**Society of Architects' Travelling Studentship. Design for a Town Hall. 25*l.* and medal.**

MAY 1. — **Wombwell.**—SWIMMING BATHS.—The Wombwell U.D.C. invite designs in competition for public swimming baths, to be erected in Hough-lane, Wombwell, Yorkshire. Three prizes of the value of 40*l.*, 30*l.*, and 20*l.* respectively are offered for the designs placed first, second and third respectively by the assessor. See advertisement in issue of February 16 for further particulars.

JUNE 28. — **Hale, Cheshire.**—TOWN PLANNING SCHEME.—Premiums 50*l.* and 25*l.* Particulars from the Council Offices, Hale.

JULY 1. — **Dusseldorf.** — **A plan for the extension of the City of Dusseldorf. Premiums of 1,000*l.* to 375*l.* Conditions on application to the Chief Burgomaster, Dusseldorf. A translation appeared on page 365, September 29.**

AUGUST 30. — SAXON SNELL PRIZE. — Fifty guineas; with medal, is offered for essay on a hospital subject. Particulars from the Sanitary Institute, 90, Buckingham Palace-road, S.W.

NO DATE.—**Jordanhill, Glasgow.**—PROPOSED TRAINING COLLEGE.—**Limited to six firms, named in Competition News, December 1, 1911, page 635.**

NO DATE. — **Warrington.** — SCHOOL. — The Warrington Education Committee invite competitive plans for the erection of a public elementary school. See advertisement in issue of February 16 for further particulars.

Contracts.

BUILDING.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

FEBRUARY 23. — **Belfast.** — HOUSES.—For erection of a terrace of dwelling-houses in Glenravel-street and Henry-place. Plans and specification with Mr. J. V. Brennan, C.E., architect, Belfast Bank-chambers, Belfast.

FEBRUARY 24. — **Bradford.** — OFFICES.—Alterations to tramway offices, Hall Ings. Drawing and conditions seen, and quantities and form of tender from the City Architect, Town Hall, Bradford.

FEBRUARY 24.—**Morley.**—GARAGE.—For erection of motor garage, Thorneycroft. Plans and specifications seen, and quantities from Mr. T. A. Buttery, Lic.R.I.B.A., architect, Queen-street, Morley

FEBRUARY 24.—**Sowerby Bridge.**—PAVILION.—For erection of a wooden pavilion. Plan and specification at the Town Hall Hotel, Sowerby Bridge.

FEBRUARY 26.—**Minehead.**—CONVENIENCES, ETC.—For erection of conveniences and shelters on the sea front. Specification and plans with the Surveyor, Market House, Minehead.

FEBRUARY 26. — **Swansea.** — HOUSE.—Erection of fifty houses in Cwm-road. Plans and specifications seen, and forms of tender from Mr. H. C. Portsmouth, architect, Llanfair-buildings, St. Mary-street, Swansea, on deposit of 2*l.* 2s.

FEBRUARY 26. — **Swansea.**—HOUSES.—Erection of fifty-three houses at Trewyddfa Common. Plans and specifications seen, and forms of tender from Mr. H. C. Portsmouth, architect, Llanfair-buildings, St. Mary-street, Swansea, on deposit of 2*l.* 2s.

FEBRUARY 27. — **London.**—COTTAGES.—Erection of four workmen's cottages on grounds adjoining Isolation Hospital, World's End, Winchmore Hill, N. Drawings and specification seen, and information from Mr. Richard Collins, Public Offices, Enfield, Middlesex.

FEBRUARY 27. — **Milnsbridge.** — PICTURE THEATRE.—For erection of a picture palace in Savile-street. Plans seen, and quantities from Messrs. Lunn & Kaye, architects and surveyors, Milnsbridge.

FEBRUARY 27. — **Todmorden.** — HOUSES, ETC.—For erection of eight houses and appurtenances at Watty. Plans and specifications seen, and quantities from Mr. T. H. Mitchell, architect, Todmorden.

FEBRUARY 28.—**Distington.**—HOUSE.—For erection of dwelling-house. Plans and specifications with Messrs. J. S. Moffat & Bentley, Lic.R.I.B.A., architects, 53, Church-street, Whitehaven.

FEBRUARY 28. — **Manchester.** — BUILDINGS.—Erection of corrugated-iron buildings at Cheetham Hill-road. Plans and specification at the Education Offices, Deansgate, Manchester, on deposit of 1*l.* 1s.

FEBRUARY 29. — **Annfield Plain.**—HOUSE.—For erection of house and stable, etc., Durham-road. Drawings and specifications with Mr. T. E. Taylor, Lic.R.I.B.A., M.S.A., architect and surveyor, The Grove, Lanchester, or Front-street, Annfield Plain.

FEBRUARY 29. — **Ashford.** — ROOM, ETC.—For construction of a general dressing-room and a range of six dressing-boxes, at the open-air swimming bath, Beaver-road. Plans and specification with Mr. William Terrill, Surveyor, 5, North-street, Ashford, Kent.

* FEBRUARY 29.—**Birmingham.**—ADDITIONS.—The Corporation of Birmingham invite tenders for alterations and additions at Moseley-street Police-station. See advertisement in this issue for further particulars.

FEBRUARY 29.—**Coventry.**—PAVILION, ETC.—For erection of new scarlet fever pavilion and alterations and additions to existing administrative and mortuary blocks. Drawings, conditions of contract and specification, forms of tender, and quantities from Mr. J. E. Swindlehurst, City Engineer and Surveyor, St Mary's Hall, Coventry. Deposit of 2*l.* 2s.

FEBRUARY 29.—**Hoole.**—HOUSE, ETC.—For erection of a park-keeper's lodge, bowl-house, and public conveniences in the Alexandra Park, and erection of a store-room over the existing fire-engine station, Westminster-road. Plans and specifications seen, and quantities and form of tender from the Building Surveyor, Mr. Fred. Davies, 14, Newgate-street, Chester, on deposit of 1*l.* 1s.

FEBRUARY 29. — **Inverness.**—ADDITIONS.—For additions and alterations to Glenmazeran Shooting Lodge and gun-room and larders at Dalmigavie Lodge. Plans, specifications, and quantities from Mr. Thos. Munro, architect, 62, Academy-street, Inverness.

FEBRUARY 29.—**Longwood.**—HOUSES.—Erection of ten dwelling-houses, Prospect-road, for the Longwood Industrial Society, Ltd. Plans seen, and quantities from Mr. Sanderson M. Balmford, architect, Longwood.

FEBRUARY 29. — **Paisley.**—STORE.—Erection of a coal store at the Gasworks, Blackstoun-road. Specifications, quantities, with forms of tender, from Mr. Geo. R. Hislop, Engineer and Manager, Corporation Gasworks, Paisley.

FEBRUARY 29. — **Rushden.** — SHED.—The Midland Railway invite tenders for the extension of goods shed. Plans and specifications seen, quantities and particulars at the Engineer's Office, Derby Station.

FEBRUARY 29. — **Stokesley.** — CONVENIENCES, ETC.—Erection of a washhouse, store-room, and conveniences in connexion with the Wesleyan Manse. Plans and specifications with Mr. Wm. Armstrong, grocer, Stokesley.

MARCH 1.—**London.**—ADDITION.—For the construction of an additional story to the General Post Office, South. Drawings, specification, and a copy of the conditions and form of contract with Mr. J. Rutherford, 22, Carlisle-place, London, S.W. Quantities and forms of tender, on deposit of 1*l.* 1s., from the Secretary, H.M. Office of Works, etc., Storey's-gate, London, S.W.

MARCH 2.—**Hyde.**—ADDITIONS, ETC.—For alterations and additions to the dwelling-houses situate 26 and 28, Union-street. Plans and specification with the Secretary, Waterworks Offices, Town Hall, Manchester. Deposit of 1*l.* 1s.

MARCH 2. — **London.**—SCHOOL.—Erection of a public secondary school for boys at The Crescent, Croydon. Drawings by Mr. H. Carter Pegg, F.R.I.B.A., of Thornton Heath. Quantities and forms of tender on deposit of 1*l.* 1s. to Mr. James Smyth, Clerk to the Committee, Education Office, Katharine-street, Croydon.

MARCH 2. — **Nelson.**—BATHS.—For erection of Public Baths at Bradley. Plans and specifications seen, and quantities and forms of tender, on deposit of 1*l.* 1s., from Mr. W. Shackleton, A.M.Inst.C.E., Borough Engineer and Surveyor, Town Hall, Nelson.

MARCH 4.—**Aberkenfig.**—HOUSES.—For erection of fourteen houses for the Pandy Estate Building Club No. 2. Plans and specifications with Mr. F. W. Burnett, architect, Tondu, near Bridgend.

MARCH 4.—**Bideford.**—CHURCH, ETC.—Erection of a large United Methodist Church, with a school hall, classrooms, etc. Plans and specification seen, and quantities, on deposit of 1*l.* 1s., from Mr. W. Beddoe Rees. architect, 3, Dumfries-place, Cardiff.

MARCH 4. — **Birmingham.**—STATION.—For the erection of an electric sub-station in Evelyn-road, Greet. Quantities on deposit of 2*l.* 2s. to the Quantity Surveyor, Mr. Anthony Rowse, King's Court, 117, Colmore-row, Birmingham. Drawings at the offices of the architects, Messrs. Arthur Harrison & Cox. Council Chambers, 109, Colmore-row, Birmingham.

MARCH 4. — **Blackwood.** — HALL.—For erection of a new mission hall. Plans and specifications with Mr. A. F. Webb, M.S.A., architect and surveyor, Blackwood. Quantities on deposit of 2*l.* 2s.

MARCH 4. — **Devizes.**—CONVENIENCE.—For new public convenience on the Green. Plans and specifications seen, and forms of tender from Mr. F. G. Billingham, Borough Surveyor, Town Hall, Devizes.

MARCH 4. — **Devon.**—HEADQUARTERS.—Erection of a headquarters and drill hall for the 4th Wessex Brigade, R.F.A. (T.F.). Plans and specification with Messrs. E. H. Harbottle & Son, County Chambers, Exeter. Quantities on deposit of 3*l.*

* MARCH 4.—**Hendon.**—MORTUARY, SHEDS, ETC.—The Hendon U.D.C. invite tenders for erection of a public mortuary, shedding, etc., at the depôt, The Burroughs, Hendon, and a store-shed at the Recreation Ground, Child's Hill. See advertisement in this issue for further particulars.

MARCH 4. — **Little Weston.** — COTTAGES.—For erection of two cottages on farm at Little Weston, Sparkford, Somerset. Messrs. Woodforde & Drewett, solicitors, Castle Cary

MARCH 4. — **Reading.** — ADDITIONS, ETC.—For alterations, additions, repairs, and painting to the swimming bath, Tilehurst-road. Drawings, specification, and general conditions seen, and form of tender from Mr. J. Bowen, A.M.Inst.C.E., Borough Engineer and Surveyor, Town Hall, Reading.

MARCH 4. — **Tipperary.**—HOUSES.—For building of thirteen stone houses for the working classes, on the Bansha-road. Plans, specifications, and conditions by the Town Surveyor, Urban Council Offices, Emmet-street, Tipperary. Deposit of 1*l.*

MARCH 5.—**Llanfairfechan.**—WALL.—Erection of a new retaining wall at Viaduct Bay, Pen-y-Clip, Llanfairfechan. Plans and specifications at the Council Offices, and information from Mr. Thomas Hughes, Surveyor to the Council, Council Offices, Llanfairfechan.

MARCH 6.—**Blackwood.**—VILLAS.—For erection of twelve semi-detached villas, for the Blackwood Central Building Club. Plans and specifications with Mr. A. F. Webb, M.S.A., architect and surveyor, Blackwood.

* MARCH 6.—**Hayes.**—HOUSES, ETC.—The Hayes U.D.C. invite tenders for laying-out of site, construction of roads, sewers, fences, etc., and the building of fifty-one houses, at Elder's Field. The tender may be for part of the work only. See advertisement in this issue for further particulars.

BUILDING—*continued.*

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

MARCH 6.—**Hove.**—STORES, ETC.—For building boundary walling, shedding, stores, and other work at Erroll-road Depôt. Drawings, specification, and form of contract seen, and quantities and form of tender from the Borough Surveyor, Mr. H. H. Scott, Town Hall, Hove. Deposit of 1*l.* 1s.

MARCH 6. — **Scarborough.** — STAND.—Erection of a grand stand (timber construction) in the Castle Yard. Plans, specification and conditions seen, and quantities and form of tender from Mr. T. W. Whipp, A.R.I.B.A., architect and chartered surveyor, 15, Valley Bridge-parade, Scarborough. Deposit of 1*l* 1s

MARCH 6. — **Ventnor.** — SEA WALL.—For construction of a sea wall. Plans, specification, and general conditions with Mr. H. Hughes Oakes, Engineer and Surveyor to the Council, Town Hall, Ventnor, I.W

* MARCH 12.—**West Ham.**—BUILDING.—The West Ham B.C. invite tenders for a building to contain twelve slipper-baths, with waiting-room, etc., in Fen-street, Tidal Basin, E. See advertisement in this issue for further particulars.

* MARCH 13.—**Hampton Court, etc.**—WORKS AND REPAIRS.—The Commissioners of H.M. Works and Public Buildings invite tenders for ordinary works and repairs to buildings in Hampton Court, Kew, and Richmond district. See advertisement in this issue for further particulars.

MARCH 13. — **St. Helens.** — CONSERVATORY.—Erection of a new conservatory at the Victoria Park. Particulars and site plan from Mr. Arthur W. Bradley, M.Inst.C.E., the Borough Engineer, Town Hall, St. Helens. Deposit of 1*l*

* MARCH 23.—**East Finchley, N.**—SCHOOL.—The Finchley U.D.C. invite tenders for new elementary school. See advertisement in this issue for further particulars.

NO DATE.—**Bolton Bridge.**—HOUSE.—Erection of a new farm-house. Plans seen, and quantities from Mr. James Hartley, architect, Skipton.

NO DATE. — **Bolton-by-Bowland.**—ADDITIONS, ETC.—Alterations and additions to Fox Ghyll House. Mr. W. F. Tempest, Estate Offices, Ackworth Grange, Pontefract

NO DATE. — **Daventry.** — ADDITIONS.—Alterations and additions to the casual wards at the Union Workhouse. Quantities from the architect, Mr. J. B. Williams, Moot Hall, Daventry.

NO DATE.—**Gosport.**—SCHOOL.—For erection of new school in Stone-lane. Deposit of 1*l.* 1s. to Mr. George R. Walker, Secretary to the Committee, High-street, Gosport.

NO DATE. — **Halifax.** — HOUSES.—Erection of four new houses and alterations to old premises at Triangle. Messrs. Clement Williams & Sons, architects. Post-office-buildings, Commercial-street, Halifax.

NO DATE. — **Halifax.** — HOUSES.—Erection of two dwelling-houses, Dudwell-lane. Messrs. Jackson & Fox, architects, surveyors and valuers, 7, Rawson-street, Halifax.

* NO DATE.—**Lichfield.**—SCHOOL.—Tenders are invited for the erection of the proposed new central mixed and infants' schools for 410 children, in Frog-lane, Lichfield. See advertisement in this issue for further particulars.

NO DATE. — **Lindale-in-Cartmel.** — ENLARGEMENT.—For the enlargement of St. Paul's Church, Lindale-in-Cartmel. Plans and specifications with Mr. Cowhard at the School House, Lindale. Quantities and forms of tenders from Mr. G. Gordon Stanham, architect, 26 and 27, Bush-lane, Cannon-street, London, E.C.

NO DATE. — **Lowestoft.**—SCHOOL.—Erection of school at Roman-hill. Deposit of 2*l.* 2s. to Mr. R. Beattie Nicholson, Town Clerk, Town Hall, Lowestoft.

NO DATE.—**Machynlleth.**—SCHOOL.—For erection of a national school and domestic science centre. Architects, Messrs. Deakin & Howard Jones, M.S.A., Plas Ynys, Borth, S.O.

NO DATE.—**Newcastle-on-Tyne.**—ADDITIONS.—For two additional storys to the Tyne Improvement Commissioners' premises, Bewick-street. Deposit of 1*l.* 1s. to Mr. W. H. Wood, F.R.I.B.A., architect, 20, Collingwood-street, Newcastle-upon-Tyne.

NO DATE.—**Old Cornforth.**—HOUSE.—For erection of the Terrace House. Messrs. Kitching & Lee, architects, Houndgate-chambers, Darlington.

NO DATE. — **Penrith.**—SCHOOL.—Erection of a new mixed secondary school. Mr. T. D. Shepherd, Clerk to the Governors, 21, King-street, Penrith.

NO DATE.—**Pontardulais.**—EMPIRE.—For erection of Messrs. Haggar's new Empire. Names to Messrs. C. S. Thomas, Meager, & Jones, 15-16, Wind-street, Swansea.

NO DATE.—**Portmadoc.**—VICARAGE.—For erection of a vicarage at Pentrefelin, Portmadoc. Mr. Clough Williams-Ellis, architect, Arundel House, Victoria-embankment, London, W.C.

NO DATE.—**Ruswarp.**—COTTAGE.—Erection of a cottage on The Carrs. Drawings and specifications with Mr. Arthur E. Young, architect and surveyor, 77, Baxtergate, Whitby.

NO DATE.—**South Bank.**—THEATRE.—Erection of an electric theatre in Normanby-road. Messrs. Moore & Archibald, architects, Prudential-chambers, Albert-road, Middlesbrough.

NO DATE. — **Stoke-on-Trent.** — ADDITIONS.—Stoke-on-Trent and Stoke Rural Joint Hospital Board. Additions and alterations to the administrative block; additions to engine and boiler house. Mr. Elijah Jones, M.S.A., Architect to the Board, 10, Albion-street, Hanley, Stoke-on-Trent.

NO DATE.—**Swansea.**—PREMISES.—For erection of new premises, Castle-street. Deposit of 3*l.* 3s. to Mr. C. Russell Peacock, M.S.A., architect, 19-21, Metal-exchange, Swansea.

ENGINEERING, IRON, AND STEEL.

FEBRUARY 27. — **Manchester.** — CRANE.—For erection at Stuart-street generating station of one 8-ton overhead hand-power travelling crane over auxiliaries. Specifications and forms of tender from Mr. F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester, on deposit fee of 1*l.* 1s. Particulars from Mr. S. L. Pearce, Chief Electrical Engineer, Dickinson-street, Manchester.

FEBRUARY 28. — **Ipswich.** — DISINFECTOR.—For supply and fixing of a high-pressure steam disinfector at the St. John's Home, Freehold-road. Specifications from Mr. L. W. Greenhalgh, Clerk to the Guardians, Guardians' Offices, 19, Tower-street, Ipswich.

MARCH 1.—**Isle of Man.**—BRIDGE.—For widening the Quarter Bridge, Braddan. Specifications and quantities from the Surveyor-General of Highways, 27, Athol-street, Douglas. Deposit of 1*l.* 1s.

MARCH 2. — **Chipping Ongar.** — BRIDGE.—For building a new bridge over the Cripsey Brook, Chipping Ongar, known as "Ackingford" Bridge. Drawings seen, and specification from Mr. Percy J. Sheldon, M.Inst.C.E., County Surveyor, Chelmsford

MARCH 2. — **Elgin.** — BRIDGE.—For removal of the existing superstructure of one span of the bridge over the River Spey at Fochabers, and for the erection of a new steel superstructure and other works. Plans, specifications, and quantities with Mr. Alexander Hogg, County Road Surveyor, 24, Academy-street, Elgin. Deposit of 1*l.*

MARCH 2.—**Halstead.**—BRIDGE.—For widening the bridge over the River Colne at Halstead. Drawings seen, and specifications, quantities, etc., from Mr. Percy J. Sheldon, M.Inst.C.E., County Surveyor, County Surveyor's Office, Chelmsford.

MARCH 23. — **Southampton.**—HEATING, ETC.—For erection of heating and hot-water supply systems, etc., at Infirmary, Shirley Warren. Specification and drawings, on deposit of 2*l.* 2s., from Mr. A. J. Walden, Clerk to the Guardians, Clerk's Offices, the Workhouse, St. Mary-street, Southampton.

FURNITURE, PAINTING, MATERIALS, etc.

FEBRUARY 24.—**York.**—PAINTING.—For painting the outside of the Court-houses and police-stations at Beverley, Bridlington, Driffield, Escrick, Holme-on-Spalding Moor, Hornsea, Howden, Market Weighton, Patrington, Pocklington. Specifications seen and forms of tender from the County Surveyor, County Hall, Beverley.

FEBRUARY 26. — **Harrogate.** — PAINTING.—For painting the exterior and interior of the Kursaal. Particulars from Mr. C. E. Rivers, A.M.Inst.C.E., Borough Engineer and Surveyor.

FEBRUARY 26. — **Stockport.** — PAINTING.—For painting, etc., at the Union Offices, Shaw Heath. Specification from Messrs. Peirce & Son, architects, 30, St. Petersgate, Stockport.

* FEBRUARY 27. — **Willesden.** — VARIOUS MATERIALS AND WORK.—The Willesden D.C. invite tenders for execution of certain works, and supply of materials for periods commencing April 1 next. See advertisement in this issue for further particulars.

MARCH 7. — **London.**—PAINTING.—For repairs, painting, whitewashing, etc., at the Newington Workhouse, Westmoreland-road, Walworth, S.E., and the Boyson-road Homes, S.E. Specification and form of tender from the Guardians' Architect, Mr. A. Saxon Snell, F.R.I.B.A., of 22, Southampton-buildings, Chancery-lane, W.C. Deposit of 10*l.*

* MARCH 13. — **Herne Bay.** — PAINTING AND CLEANING.—The Metropolitan Asylums Board invite tenders for painting and cleaning work at St. Anne's Home, Herne Bay, Kent. See advertisement in this issue for further particulars.

* MARCH 13. — **London.**—WINDOW CLEANING.—The Commissioners of H.M. Works and Public Buildings invite tenders for window cleaning at buildings under their charge for one year from April 1 next. See advertisement in this issue for further particulars.

* MARCH 13. — **London, W.**—MATERIALS.—The St. Marylebone B.C. invite tenders for supply of materials for one year commencing April 1 next. See advertisement in this issue for further particulars.

ROADS, SANITARY AND WATER WORKS.

FEBRUARY 27. — **Bootle.**—STREETS.—For private street works. Plans, etc., at the Borough Engineer's Office.

FEBRUARY 27. — **Southampton.**—STREETS.—For private street works in Trinity-terrace Plans, specification, and conditions seen, and form of tender and quantities at the Borough Engineer's Office. Deposit of 1*l.* 1s.

FEBRUARY 28. — **Langley Moor.** — ROAD.—For raising the main road at Langley Cottages. Plans, specification, and conditions of contract seen, and quantities from Mr. W. Crozier, A.M.Inst.C.E., County Surveyor, Shire Hall, Durham.

MARCH 2.—**York.**—STONE.—For supply of about 7,000 tons of stone. Conditions, forms of tender, and particulars from the County Surveyor, County Hall, Beverley.

* MARCH 4.—**Hendon.**—WATER DRAINAGE.—The Hendon U.D.C. invite tenders for certain sewerage and surface-water drainage, kerbing, channelling, paving, metalling, etc., in connexion with certain roads. See advertisement in this issue for further particulars

MARCH 5. — **London.** — ROAD.—For kerbing, channelling, and metalling the roadways, and paving the footpaths with artificial stone, of Collingtree-road, Sydenham. Plan at the Town Hall, Catford (Surveyor's Department). Form of tender, general conditions, and specification, on deposit of 5s., from Mr. Edward Wright, Town Clerk, Town Hall, Catford, S.E.

* MARCH 23. — **Westmancote.** — SEWER.—The Tewkesbury R.D.C. invite tenders for laying sewer and construction of works at Westmancote, in the Parish of Bredon. See advertisement in this issue for further particulars.

Public Appointment.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*CLERK OF WORKS	The Gdns. of St. George's U.	3*l.* 10s. per week	Feb. 28

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*FREEHOLD PROPERTY, EUSTON-ROAD, N.W.—At the Mart	Rutley, Son, & Vine	Feb. 27
*BUILDER AND CONTRACTOR'S PLANT—Upon the Premises	Wheatley Kirk, Price, & Co.	Feb. 27, 28, 29
*BUILDING LEASE, NEWGATE-STREET—At the Mart	H. Collier & Madge	Mar. 1
*BUILDING SITE, LONG-ACRE, W.C.—At the Mart	Robins, Gore, & Mercer	Mar. 5
*FREEHOLD LAND, TOOTING, S.W.—At the Mart	Douglas Young & Co.	Mar. 6
*BUILDERS', CONTRACTORS', ETC., PLANT—At the Maltings, Fishpool-st., St. Albans	J. T. Skelding	Mar. 12
*OFFICE BUILDING, CHEAPSIDE—At the Mart	Marler & Marler	Mar. 18
*FREEHOLD PROPERTY, SOHO-SQUARE, W.—At the Mart	Farebrother, Ellis, Egerton, Breach, Galsworthy, & Co.	Mar. 21
*BUILDING SITE, HATTON-GARDEN, E.C.—At the Mart	Farebrother, Ellis, Egerton, Breach, Galsworthy, & Co.	Mar. 21

THE QUANTITY SURVEYORS' ASSOCIATION.

AN extraordinary general meeting of the members of this Association was held on Monday evening last at Caxton House, Westminster, S.W., at which the following by-law was adopted:—

"No Member or Associate of the Association shall prepare Bills of Quantities for less than the Schedule of Charges recommended by the Association for adoption by Public Authorities, excepting only in cases where a Public Authority may have already issued a special scale of charges for their particular work. No Member or Associate shall under any circumstances work for the said Authority for a lower remuneration than this special scale.

"Any Member or Associate of the Association who shall act in contravention of this by-law shall be considered guilty of conduct prejudicially affecting the reputation of the Association, and shall be dealt with by the Council as provided in Clause 29 of the Articles of Association.

"It shall be the duty of the Members or Associates of the Association to acquaint the Council, through the Secretary, of the existence of any scale of charges issued by any public body which stipulates lower rates of charges than those recommended by the Association, in order that the Council may communicate with the public body in question, with the view of endeavourng to prevail upon such public body to make their scale conform with that of the Association."

FOREIGN AND COLONIAL.

Building Construction and Material, Southern Nigeria.

The official *Lagos Customs and Trade Journal* of January 2 states that tenders are invited for the construction of a new General Post Office at Lagos. Copies of the specifications and bills of quantities may be obtained from the Director of Public Works, Lagos, on deposit of 10*l.* 10s., which will be returned on receipt of a *bonâ-fide* tender. No date is mentioned to which tenders will be received. The *Customs and Trade Journal* points out that the rapidly expanding trade of Lagos affords opportunity of substantial business to British builders. The Government expenditure in Lagos this year on new works and buildings is estimated at 68,000*l.*, including 15,000*l.* for quarters for officials, 5,000*l.* for a new wing to Government House, 11,500*l.* for the new General Post Office, etc. Further, as the trade of Lagos and the wealth of the people increase, substantial buildings are taking the place of the shanties and huts formerly used, and a large business might be done with private individuals.

Building Works, Brazil.

The *Diario Official* of January 5 publishes the text of the Brazilian Budget expenditure for 1912 as per law No. 2,356 of January 4, 1912. Among the items of interest the following may be noted:—

The Ministry of Justice and Home Affairs is authorised to expend 700,000 milreis (currency) for continuing building operations and carrying out improvements at the Pedro II College, the Central Disinfecting Institute for Public Health, the Library of the National Institute of Music, and at the Benjamin Constant Institute; 168,000 milreis (currency) for the purchase of fire extinguishing appliances, etc., such as pumps, fire alarms, and motor fire-engines; 350,000 milreis (currency) to complete the building and equipment of the hospital for tuberculosis; 272,575 milreis (currency) to complete the National School of Fine Arts.

The Ministry of Marine is authorised to expend 30,000 milreis (currency) for the purchase and erection of a lighthouse; 1,000,000 milreis (currency) for the reconstruction of the Arsenal at Rio de Janeiro.

The President of the Republic is authorised (1) to expend up to 150,000 milreis (currency) for the erection of a technical school for apprentices in the State of São Paulo; (2) to make a grant to the municipal authorities of Federal States of 4,000 milreis (currency) per kilometre for the making of roads suitable for motor vehicle traffic; (3) to expend up to 300,000 milreis (currency) for the erection of a new Arts and Crafts College in Rio. The Government are further authorised (1) to expend up to 500,000 milreis (currency) for the rebuilding of the National Printing Office; (2) to negotiate with the Government of Uruguay for the building of frontier bridges across the rivers Jaguarao and Quarahim; and (3) to expend up to 5,000,000 milreis (currency) for building and rebuilding and repairing Customs houses and other Revenue offices.

Milreis (currency) = 1s. 4d.; Milreis (gold) = 2s. 3d.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 1.—By GRIMLEY & SON.

Edgbaston, Warwick.—Sandon-rd., f.g. rents 29*l.* 13s. 3d., reversion in 80 yrs. — £700
Rathbone-rd., f.g. rents 15*l.*, reversion in 94 yrs. — 350
Small Heath, Worcs.—45 and 47, Arthur-st. (s.), u.t. 58 yrs., g.r. 9*l.* 6s. 4d. — 1,290
79 to 89 (odd), Mansel-rd., u.t. 86 yrs., g.r. 15*l.*, w.r. 101*l.* 8s. — 700

February 6.—By MILLER, PAXTON, & FAIRMINER.

Stamford Hill.—Plevna-rd., f.g. rents 35*l.*, reversion in 62 yrs. — 705

By TYSER, GREENWOOD, & Co.

Chiswick.—Hartington-rd., Melville, u.t. 87 yrs., g.r. 16*l.* 16s., e.r. 80*l.* — 500

By W. B. HALLETT.

Goring, Oxon.—Portion of the Hardwick Estate, 904 acres, f. — 19,005

February 7.—By EDWIN FOX, BOUSFIELD, BURNETTS, & BADDELEY.

City.—22, Basinghall-st., u.t. 26½ yrs., g.r. 305*l.*, gross rental 1,503*l.* 10s. — 5,800

By FURBER.

Chelsea.—65, Edith-gr., u.t. 52 yrs., g.r. 7*l.*, p. — 250
Pimlico.—3, Churton-pl., u.t. 18 yrs., g.r. 6*l.* 10s., q.r. 48*l.* — 170

By DOUGLAS YOUNG & Co.

South Lambeth.—46, 48, and 50, Wilcox-rd., and 1 to 4, Little Spring-pl., u.t. 10 yrs., g.r. 20*l.* 10s., w.r. 150*l.* 16s. — 150

By ERNEST R. OXBORROW.

Ipswich, Suffolk.—249 to 255 (odd), Cauldwell Hall-rd., f., y. and e.r. 69*l.* — 1,045
28 and 30, Cardigan-st., f., y.r 37*l.* — 480

February 8.—By HERRING, SON, & DAW.

Tooting.—76 and 78, Moring-rd., u.t. 85 yrs., g.r. 14*l.*, w.r. 67*l.* 12s. — 250

By NEWBON & SHEPHARDS.

Kentish Town.—73 and 75, Bartholomew-rd., u.t. 47½ yrs., g.r. nil, y.r. 104*l.* — 900
30, Goldington-st, u.t. 39 yrs., g.r. 5*l.* 10s., y.r. 36*l.* — 220
Islington.—William-st., f.g.r. 26*l.*, reversion in 33¾ yrs. — 580
Clerkenwell.—38, Red Lion-st., f., p. — 255

February 8.—By STIMSON & SONS.

Bermondsey.—29, Fort-rd (s.), u.t. 11¾ yrs., g.r. 3*l.*, y.r. 32*l.* — 100
34, Beatrice-rd., u.t. 26¾ yrs., g.r. 5*l.*, w.r. 37*l.* 14s. — 180
44, Southwark Park-rd., u.t. 21¼ yrs., g.r. 5*l.*, w.r. 46*l.* 16s. — 175
New Cross.—14 and 16, Achilles-st., f., w.r. 62*l.* 8s. — 580
Camberwell.—24 and 26, St. Georges-rd., u.t. 22 yrs., g.r. 7*l.*, w.r. 70*l.* 4s. — 230
Peckham.—119, Peckham-rd., f., e.r. 32*l.* — 270
Hoxton.—66 and 70, Hyde-rd. (s.), u.t. 24½ yrs., g.r. 13*l.*, y.r. 104*l.* — 645
Stoke Newington.—48, Spenser-rd., u.t. 40 yrs., g.r. 5*l.*, w.r. 36*l.* 8s. — 120

By JOSEPH STOWER.

Kennington.—Church-st., f.g.r. 3*l.*, reversion in 7 yrs. — 200

By DYER, SON, & HILTON.

Blackheath.—34, Lee-rd., u.t. 41 yrs., g.r. 11*l.*, — 870

February 9.—By JOHN DAVEY & Co.

Charlton.—41, Kinveachy-gdns., u t. 91 yrs., g.r. 5*l.* 10s., w.r. 41*l.* 12s. — 280

By PERCIVAL HODSON.

Finsbury Park.—41 and 43, Campbell-rd., f., w.r. 84*l.* 10s. — 370
Stroud Green.—1, Osborne-gr., f., q.r. 28*l.* — 335

February 12.—By WALLER & KING.

Southampton.—9, 13, and 14, St. Mark's-rd. (s.), u.t. 953 yrs., g.r. 14*l.*, y. and e.r. 100*l.* — 1,250
31 and 33, North-rd., f., w.r. 31*l.* 4s. — 280

February 13.—By THURGOOD & MARTIN.

Thornton Heath.—Trafford and Silverleigh roads, f.g. rents 398*l.* 5s., reversion in 85 yrs. — 8,200

By HASLETT.

Westminster.—Princes-st., Red Lion p.h., lease for 18 yrs. at 100*l.* p.a. — 1,800

By WEATHERALL & GREEN.

Pimlico.—3, St. Georges-sq., u.t. 21¾ yrs., g.r. 16*l.* 10s., e.r. 120*l.* — 210

By DREWEATT & WATSON.

Donnington, Berks.—The Cedars, cottage and 3 acres, f. — 2,350

By SEDGWICK, SON, & WEALL.

Watford.—21, Market-st. (s.), f., p. — 900
High-st., freehold malting — 510
Market-st., plot of land, f. — 175

February 14.—By DONALDSON & SONS.

Dalston.—15, Albion-rd., u.t. 33 yrs., g.r. 6*l.*, p. — 200

By DUNCAN & KIMPTON.

Tottenham Court-rd.—9 and 11, Warren-st., f., y. and w.r. 170*l.* 10s. — 1,390
Hackney.—167 and 173, Cassland-rd., u.t. 33 yrs., g.r. 8*l.*, w.r. 78*l.* — 375

By GILBERT & HOW.

Holloway.—19, Thane-villas, u.t. 143 yrs., g.r. 12*l.* 12s., e.r. 50*l.* — 350
47, St. John's-villas, f., y.r. 52*l.* 10s. — 555
Crouch Hill.—41, Ashley-rd., u.t. 63 yrs., g.r. 11*l.*, e.r. 60*l.* — 415
West Ham.—Ash-rd., f.g.r. 6*l.*, reversion in 48 yrs. — 115

February 15.—By G. ERNEST CLARKE & Co.

Walthamstow.—352 and 354, Hoe-st., f., y.r. 45*l.* and p. — 1,070
289 to 299 (odd), Hoe-st., f., y.r. 130*l.* and p. — 3,175
42, 44, 51, 53, 63, and 65, Grosvenor Park-rd., f., y.r. 158*l.* — 2,100
1, Granville-rd., f., w.r. 44*l.* 4s. — 350

By STIMSON & SONS.

Tooting.—Beechcroft-rd., f.g. rents 37*l.* 16s., reversion in 95 yrs. — £840
Mandrake-rd., f.g. rents 18*l.* 18s., reversion in 95 yrs. — 425
Wimbledon.—Arthur-rd., f.g.r. 24*l.*, reversion in 95 yrs. — 455
Home Park-rd., f.g. rents 20*l.*, reversion in 93 yrs. — 490
Wandsworth.—43, 45, 47, 49, 55, 57, 59, and 61, Fairfield-st., f., w.r. 262*l.* 12s. — 2,370
57*l.*, York-rd., f., y.r. 55*l.* — 840
72, 78, 80 82, and 84, Putney Bridge-rd., f., w.r. 124*l* 16s. — 1,140
113, Lavenham-rd., u.t. 88½ yrs., g.r. 5*l.* 10s., w.r. 32*l.* 10s. — 165
Wimbledon.—51 and 75, Revelstoke-rd., u.t. 93 yrs., g r. 12*l.*, w.r. 74*l.* 4s. — 415
113, 115, and 143, Revelstoke-rd., u.t. 93 yrs., g.r 18*l.*, w.r. 114*l.* 12s. — 620
196, Revelstoke-rd., u.t. 91 yrs., g.r. 6*l.*, w.r. 37*l.* 16s. — 250
66 and 68, Braemar-rd., u.t. 93 yrs., g.r. 6*l.*, w.r. 70*l.* 4s — 400
12, 14, and 49, Marlborough-rd., u.t. 93 yrs., g.r. 18*l.*, y. and w.r. 106*l.* — 775

February 16.—By GARLANDS.

Caledonian-rd.—50, Brewery-rd., u.t. 47 yrs., g r. 25*l.*, y.r. 200*l.* — 310
Forest Gate.—4, Westbury-rd., u.t. 850 yrs., g.r. 4*l.* 10s., w.r. 36*l.* — 225

By DANIEL WATNEY & SONS.

Cudham, Kent.—South-st., The Cottage and 5 a. 3 r. 11 p., f., p. — 800

***Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.**

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the prepaid rate of 11s. per annum, with delivery *by Friday Morning's Post* in London and its suburbs.

To Canada, post-free, 21s. 8d. per annum; and to all part of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 26s. per annum.

Remittances (payable to J. MORGAN) should be addressed to The Publisher of "THE BUILDER," 4, Catherine-street, W.C.

PRICES CURRENT OF MATERIALS.

**** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Per 1000 Alongside, in River.	£ s. d.
Best Stocks	1 14 0
Picked Stocks for Facings	2 7 0

Per 1000, Delivered at Railway Depôt.

	£ s. d.		£ s. d.
Flettons	1 12 0	Best Blue Pressed Staffordshire	3 15 0
Best Fareham Red	3 12 0	Do. Bullnose	4 0 0
Best Red Pressed Ruabon Facing	5 0 0	Best Stourbridge Fire Bricks	4 0 0

GLAZED BRICKS—

Best White, Ivory, and Salt Glzd. Str'tch'rs	11 7 6	Double Headers	13 17 6
		One Side and two Ends	17 17 6
Headers	10 17 6	Two Sides and one End	18 17 6
Quoins, Bullnose, and 4½ in. Flats	14 17 6	Splays & Squints	16 7 6
D'ble Stretchers	16 17 6		

Second Quality £1 10s. per 1000 less than best.

	s. d.	
Thames and Pit Sand	6 9	per yard, delivered.
Thames Ballast	5 6	" "
Best Portland Cement	31 0	per ton, "
Best Ground Blue Lias Lime	19 0	" "

NOTE—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime — 13s. 0d. per yard delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly dpt.

STONE.

Per Ft. Cube.

	s. d.
BATH STONE — delivered on road waggons, Paddington Depôt	1 6½
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½
PORTLAND STONE (20 ft. average)—	
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 3
White Basebed, delivered on road waggons Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 4½

Per Ft. Cube, delivered at Railway Depôt.

	s. d.		s. d.
Ancaster in blocks	1 10	Closeburn Red Freestone	2 0
Beer in blocks	1 6	Red Mansfield Freestone	2 4
Greenshill in blocks	1 10	Talacre & Gwespyr Stone	2 8
Darley Dale in blocks	2 4		
Red Corsehill in blocks	2 3		

STONE (*Continued*).

	s.	d.
YORK STONE—*Robin Hood Quality.*		
Per Ft. Cube, Delivered at Railway Depôt.		
Scappled random blocks	2	10
Per Ft. Super., Delivered at Railway Depôt.		
6 in. sawn two sides landings to sizes (under 40 t. super.)	2	3
6 in. rubbed two sides ditto, ditto	2	6
6 in. rubbed two sides slabs (random sizes)	0	11½
3 in. sawn two sides slabs (random sizes)	0	7
2 in. to 2½ in. sawn one side slabs (random sizes)	0	6
1½ in. to 2 in. ditto, ditto		
HARD YORK—		
Per Ft. Cube, Delivered at Railway Depôt.		
Scappled random blocks	3	0
Per Ft. Super., Delivered at Railway Depôt.		
6 n. sawn two sides landing to sizes (under 40 ft. super.)	2	8
6 in. rubbed two sides ditto	3	0
3 in. sawn two sides slabs (random sizes)	1	2
2 in. self-faced random flags	0	5

SLATES.

Per 1000 of 1200 at Railway Depôt.

In. In.	£	s.	d.	In. In.	£	s.	d.
20×10 best blue Bangor	13	2	6	20×10 best Eur'ka unfading green	15	17	6
20×12 ditto	13	17	6	20×12 ditto	18	7	6
20×10 1st quality ditto	13	0	0	18×10 ditto	13	5	0
20×12 ditto	13	15	0	16×8 ditto	10	5	0
16×8 ditto	7	5	0	20×10 permanent green	11	12	6
22×10 best blue Portmadoc	12	12	6	18×10 ditto	9	12	6
16×8 ditto	6	12	6	16×8 ditto	6	12	6

TILES.

At Railway Depôt.

	s.	d.		s.	d.
Best plain red roofing (per 1000)	42	0	Best "Hartshill" brand, plain sand-faced (per 1000)	50	0
Hip and Valley (per doz.)	3	7	Do. pressed (per 1000)	47	6
Best Broseley (per 1000)	50	0	Do. Ornamental (per 1000)	50	0
Do. Ornamental (per 1000)	52	6	Hip (per doz.)	4	0
Hip and Valley (per doz.)	4	0	Valley (per doz.)	3	6
Best Ruabon red, brown, or brindled (Edw'ds) (per 1000)	57	6	Staffords. (Hanley) Reds or Brindled (per 1000)	42	6
Do. Ornamental (per 1000)	60	0	Hand-made sand-faced (per 1000)	45	0
Hip (per doz.)	4	0	Hip (per doz.)	4	0
Valley (per doz.)	3	0	Valley (per doz.)	3	6

WOOD.

BUILDING WOOD.	At per standard.					
	£	s.	d.		£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14	0	0	...	15	10	0
Deals: best 3 by 9	13	10	0	...	14	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	10	0	...	12	10	0
Battens: best 2½ by 6 and 3 by 6	0	10	0		less than 7 in. and 8 in.		
Deals: seconds	1	0	0		less thn best.		
Battens: seconds	0	10	0	"		"	
2 in. by in. and 2 in. by 6 in.	9	10	0	...	10	10	0
2 in. by 4½ in. and 2 in. by 5 in.	9	0	0	...	10	0	0
Foreign Sawn Boards—							
1 in. and 1½ in. by 7 in.	0	10	0		more than battens.		
½ in.	1	0	0		"		
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft.						
	5	0	0	...	5	10	0
Seconds	4	10	0	...	5	0	0
Small timber (8 in. to 10 in.)	3	17	6	...	4	0	0
Small timber (6 in. to 8 in.)	3	5	0	...	3	10	0
Swedish balks	2	12	6	...	3	0	0
Pitch-pine timber (30 ft. average)	5	5	0	...	6	0	0

JOINERS' WOOD.	At per standard.					
	£	s.	d.		£	s.	d.
White Sea: first yellow deals, 3 in. by 11 in.	24	10	0	...	25	10	0
3 in. by 9 in.	22	10	0	...	23	10	0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0	...	18	0	0
Second yellow deals, 3 in. by 11 in.	19	0	0	...	20	0	0
" " 3 in. by 9 in.	18	0	0	...	19	10	0
Battens, 2½ in. and 3 in. by 7 in.	14	0	0	...	15	0	0
Third yellow deals, 3 in. by 11 in. and 9 in.	14	0	0	...	15	0	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0	...	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	10	0	...	22	10	0
Do. 3 in. by 9 in.	18	10	0	...	19	10	0
Battens	14	0	0	...	15	0	0
Second yellow deals, 3 in. by 11 in.	16	10	0	...	17	10	0
Do. 3 in. by 9 in.	15	0	0	...	16	0	0
Battens	11	10	0	...	12	10	0
Third yellow deals, 3 in. by 11 in.	13	10	0	...	14	10	0
Do. 3 in. by 9 in.	13	0	0	...	14	0	0
Battens	10	10	0	...	11	0	0
White Sea and Petersburg—							
First white deals, 3 in. by 11 in.	15	0	0	...	16	0	0
" " 3 in. by 9 in.	14	0	0	...	14	10	0
Battens	11	10	0	...	12	10	0
Second white deals, 3 in. by 11 in.	14	0	0	...	15	0	0
" " 3 in. by 9 in.	13	0	0	...	14	0	0
Battens	10	10	0	...	11	0	0
Pitch-pine: deals	19	0	0	...	21	0	0
Under 2 in. thick extra	0	10	0	...	1	0	0
Yellow Pine—First, regular sizes	48	0	0		upwards.		
Oddments	32	0	0		"		
Seconds, regular sizes	33	0	0		"		
Oddments	28	0	0		"		
Kurai Pine—Planks per ft. cube.	0	4	6	...	0	6	0
Danzig and Stettin Oak Logs— Large, per ft. cube	0	3	0	...	0	3	9
Small " "	0	2	6	...	0	2	6
Wainscot Oak Logs, per ft. cube	0	6	6	...	0	8	0
Dry Wainscot Oak, per ft. sup. as inch	0	0	10	...	0	1	0
¼ in. do. do.	0	0	8½	...	—		
Dry Mahogany—Houndras, Tabasco, per ft. super. as inch.	0	0	10	...	0	1	1
Selected, Figury, per ft. super. as inch	0	1	6	...	0	2	6

WOOD (*Continued*).

JOINERS' WOOD (*Continued*)—	At per standard.					
	£	s.	d.		£	s.	d.
Dry Walnut, American, per ft. super. as inch	0	0	10	...	0	1	0
Teak, per load	18	0	0	...	22	0	0
American Whitewood planks, per ft. cube	0	5	0	...	0	6	0
Prepared Flooring, etc.—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	...	0	17	0
1 in. by 7 in. yellow, planed and matched	0	14	0	...	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	...	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	...	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	...	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	...	0	16	6
⅞ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	...	0	13	6
1 in. by 7 in. " "	0	14	0	...	0	18	6
⅞ in. by 7 in. white " "	0	10	0	...	0	11	0
1 in. by 7 in. " "	0	12	9	...	0	15	0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton.						
	£	s.	d.		£	s.	d.
Rolled Steel Joists, ordinary sections	7	10	0	...	8	0	0
Compound Girders, ordinary sections	9	10	0	...	10	0	0
Steel Compound Stanchions	11	0	0	...	12	0	0
Angles, Tees, and Channels, ordinary sections	9	10	0	...	10	0	0
Flitch Plates	9	10	0	...	9	10	0
Cast Iron Columns & Stanchions, including ordinary patterns	7	10	0	...	8	10	0

METALS.

	Per ton, in London.						
	£	s.	d.		£	s.	d.
IRON—							
Common Bars	9	0	0	...	9	10	0
Staffordshire Crown Bars, good merchant quality	9	5	0	...	9	15	0
Staffordshire "Marked Bars"	11	0	0	...	—		
Mild Steel Bars	9	5	0	...	9	15	0
Hoop Iron, basis price	10	0	0	...	—		
" " Galvanised	17	10	0	...	—		
(*And upwards, according to size and gauge.)							
Sheet Iron Black—							
Ordinary sizes to 20 g.	10	5	0	...	—		
" " 24 g.	11	5	0	...	—		
" " 26 g.	12	15	0	...	—		
Sheet Iron, Galvanised, flat, ordinary quality—							
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	15	10	0	...	—		
Ordinary sizes to 22 g. and 24 g.	16	0	0	...	—		
" " 26 g.	17	0	0	...	—		
Sheet Iron, Galvanised, flat, best quality—							
Ordinary sizes to 20 g.	18	10	0	...	—		
" " 22 g. and 24 g.	19	0	0	...	—		
" " 26 g.	20	10	0	...	—		
Galvanised Corrugated Sheets—							
Ordinary sizes, 6ft. to 8ft. 20 g.	15	0	0	...	—		
" " 22 g. and 24 g.	15	5	0	...	—		
" " 26 g.	16	15	0	...	—		
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker	12	10	0	...	—		
Best Soft Steel Sheets, 2 g. & 24 g.	13	10	0	...	—		
" " 26 g.	15	10	0	...	—		
Cut Nails, 3 in. to 6 in.	11	0	0	...	11	10	0
(Under 3 in., usual trade extras.)							

LEAD, &c.

	£	s.	d.		
LEAD—Sheet, English, 4lb. and up	19	12	6	...	—
Pipe in coils	20	2	6	...	—
Soil pipe	23	2	6	...	—
Compo pipe	23	2	6	...	—
ZINC—Sheet—	In casks of 10 cwt.				
Vielle Montagne	33	10	0	...	—
Silesian	33	5	0	...	—
Zinc, in bundles, 1s. per cwt. extra.					
COPPER—					
Strong Sheet per lb.	0	1	0	...	—
Thin " "	0	1	1	...	—
Copper nails "	0	0	10	...	—
Copper wire "	0	0	10	...	—
BRASS—					
Strong Sheet "	0	0	11	...	—
Thin "	0	1	0	...	—
TIN—English Ingots "	0	1	11	...	—
SOLDER—Plumbers' "	0	0	8½	...	—
Tinmen's "	0	0	11	...	—
Blowpipe "	0	1	2	...	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.*

Per Ft., Delivered.

15 oz. thirds	2½d.	26 oz. fourths	3½d.
" fourths	1½d.	32 oz. thirds	5d.
21 oz. thirds	3d.	" fourths	4½d.
" fourths	2½d.	Fluted Sheet, 15 oz.	3½d.
26 oz. thirds	4d.	" 21 oz.	4½d.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.*

Per Ft., Delivered.

¼ Hartley's	2d.	Figured Rolled, Oxford Rolled, Oceanic, Arctic, Muffled, and Rolled Cathedral, white	3½d.
5/16 "	2½d.		
⅜ "	2½d.	Ditto, tinted	5d.

* Not less than three crates.

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	3	3
" " " in barrels	"	0	3	4
" " " in drums	"	0	3	6
Boiled " in barrels	"	0	3	6
" " " in drums	"	0	3	9
Turpentine in barrels	"	0	2	11
" in drums	"	0	3	1
Genuine Ground English White Lead, per ton		26	10	0
Red Lead, Dry	"	23	5	0
Best Linseed Oil Putty	per cwt.	0	10	0
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon.		
	£	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	6
Fine Elastic Carriage	0	12	0
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	10	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flating Varnish	0	18	0
White Pale Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	0
Berlin Black	0	16	0
Knotting	0	10	9
French and Brush Polish	0	10	6

TO CORRESPONDENTS.

NOTE.—All communications with respect to literary and artistic matters should be addressed to "THE EDITOR" (and not to any person by name); those relating to advertisements and other exclusively business matters should be addressed to "THE PUBLISHER," and *not* to the Editor.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples sent to or left at this office, unless he has specially asked for them.

All drawings sent to or left at this office for consideration should bear the owner's name and address on either the face or back of the drawing. Delay and inconvenience may result from inattention to this.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

N.B.—Illustrations of the First Premiated Design in any important architectural competition will always be accepted for publication by the Editor, whether they have been formally asked for or not.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursday.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.* unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

AYLESFORD.—For erection of a small engine-house at the sewage works, for Maidstone Corporation. Mr. T. F. Bunting, Borough Surveyor:—

G. Pearce & Son	£220 0	R. Barnly	£209 4
C. B. Benfield	217 0	Martin & Newman	208 10
W. T. Burrows	210 10	B. Ballard	195 0

BEXHILL.—For the erection of an infants' school, for the Education Committee of the Borough of Bexhill-on-Sea. Mr. Burke-Downing, F.R.I.B.A., architect. Quantities by Messrs. John Leaning & Sons:—

Martin Wells & Co.	£5,455 0 0
W. J. Ingleton	5,311 6 11
W. Bell & Sons	5,267 0 0
A. J. Bessant	5,201 0 0
Hutchinson & Co.	5,199 3 0
Strange & Sons, Ltd.	5,094 0 0
W. J. Fryer & Co.	5,068 16 9
J. Longley & Co.	4,971 0 0
Banks & Gearing	4,951 0 0
W. T. Burrows	4,930 15 0
Peerless Dennis & Co., Ltd.	4,898 0 0
F. Sandell & Sons	4,842 10 0
R. Cook & Sons, Crawley*	4,826 10 0

BOGNOR (Sussex).—For the erection of Courtfield House School, Victoria-drive. Mr. W. Tillot Barlow, A.R.I.B.A., architect, 4, Queen-street-place, London, E.C. Quantities by Mr. Henry G. Tarrant, M.Q.S.A., Falcon-court, 32, Fleet-street, London, E.C.:—

Cummins & Sons, Ltd.	£5,619
J. Jarvis & Sons	5,388
G. Trollope & Colls, Ltd.	5,226
W. Johnson & Co., Ltd.	5,105
Rowland Bros.*	5,099

BRIDLINGTON.—For erection of a detached residence, Meadowfield-road. Mr. A. Chas. Blackmore, architect, Hull and Bridlington. Quantities by Mr. H. Ashley Cooper, Hull:—

F. W. Martindale	£1,148 0 0	Quebell, Son, & Greenwood, Ltd.	£1,057 0 0
J. H. Fenwick	1,139 0 0	F. Usher	1,021 15 3
T. A. Moore, Ltd.	1,126 4 8	Turner & Son	1,011 4 10
A. A. Booth	1,071 12 6	Sampson & Liddall, Bridlington*	1,008 17 3
J. M. Smallwood	1,064 7 2		

GRAVESEND.—For erection of a concert stand and refreshment kiosk, for Corporation of Gravesend:—

W. & F. Tuffee	£298 0 0	Milton Bros.	£240 10 0
Multon & Wallis	280 0 0	Smith & Co.	239 17 6
Lingham & Etherington	278 15 0	A. E. Tony	237 0 0

HARLOW.—For construction of sewage-disposal works and laying sewer. Messrs. Tooley & Foster, engineers, Buckhurst Hill :—

T. Adams & Sons	£8,042 0 0	Middleton & Hopper	£7,000 0 0
Kemp Bros.	7,844 6 2	D. T. Jackson	6,883 0 0
Manders & Hill	7,757 0 0	W. & C. French	6,645 0 0
P. R. Paul	7,750 0 0	T. W. Pedrette	6,578 0 0
P. Wilson	7,584 0 0		
Wilson, Border, & Co.	7,075 0 0		

HATFIELD.—For construction of sewers and cast-iron pumping main, also pumping station, tanks, etc., for Hatfield Rural District Council. Mr. G. Bertram Kershaw, engineer, West Wickham :—

Pethick Bros.	£8,706 2 0	A. G. Osenton	£6,900 17 10
J. Stone	7,568 16 8	C. Ford	6,815 6 10
Middleton & Hopper	7,527 7 5	P. Wilson & Co.	6,478 6 1
D. J. Jackson	7,429 6 6	H. M. Blaker	6,463 9 0
T. Smart	7,239 11 1	W. Moss & Son	6,350 13 0
A. Hyslop	7,178 19 8	Simon, Johnson, & Co., Manchester*	5,924 15 7
W. Griffith & Co.	7,126 12 7	S. Redhouse & Son‡	5,732 5 4
T. W. Pedrette	7,065 7 6		
T. Wood	6,943 14 2		

‡ Withdrawn.

LONDON.—For the erection of the Church of the Holy Spirit, Clapham Common, S.W. Mr. H. P. Burke-Downing, F.R.I.B.A., architect, 12, Little College-street, Westminster Abbey. Quantities by Messrs. Widnell & Trollope :—

Staines & Sons	£11,195	L. H & R. Roberts	£9,998
J. Carmichael	10,544	Dove Bros.	9,775
J. W. Faulkner & Son	10,391	J. Garrett & Son	9,532
R. A. Lowe & Co.	10,299	A. Fairhead & Son, Enfield*	9,525
R. Cook & Sons	10,153		

LONDON.—For the alterations at West Hampstead Police-station. Mr. J. Dixon Butler, F.R.I.B.A., Surveyor to the Metropolitan Police District, New Scotland-yard, S.W. Quantities by Messrs. Thurgood, Son, & Chidgey, 8, Adelphi-terrace, Strand, W.C. :—

Prestige & Co., Ltd.	£2,469 0 0	J. Gibb	£2,323 0 0
C. B. King, Ltd.	2,430 9 6	Grover & Son	2,280 0 0
W. J. Maddison	2,413 0 0	Higgs & Hill, Ltd.	2,180 0 0
Holloway Bros. (London), Ltd.	2,400 0 0	W. Eyre	2,087 0 0
Moss & Sons, Ltd.	2,392 0 0	Lole & Co.	2,052 0 0
		J. Chessum & Sons	1,892 0 0

LONDON.—For erection of greenhouses at Clissold Park and Ravenscourt Park, for the London County Council :—

Clissold Park.

J. Grover & Son	£162
J. & C. Bowyer, Ltd.	142
Marchant, Hirst, & Co.	{144 / 141‡

Ravenscourt Park.

J. Grover & Son	£185 10
J. & C. Bowyer, Ltd.	170 0
Marchant, Hirst, & Co.	{156 10 / 151 0‡

‡ Alternative tender.

LONDON.—For supply of pneumatic tools required for the third section of the central car repair depôt, for the London County Council :—

Consolidated Pneumatic Tool Co., Ltd.	£498 3 8
Howard Pneumatic Engineering Co., Ltd.	{361 4 0‡ / 447 18 0
Globe Pneumatic Engineering Co., Ltd.	411 8 4

[The estimate of the Chief Officer of Tramways, comparable with the tenders, is £500.]

‡ Alternative tender, not to specification.

LONDON.—For erection of the Vauxhall sub-station, for the London County Council :—

Leslie & Co., Ltd.	£7,643	W. Downs	£6,882
Kerridge & Shaw	7,337	Holloway Bros. (London), Ltd.	6,830
Higgs & Hill, Ltd.	7,290	C. Wall, Ltd.	6,785
H. L. Holloway	7,076	Patman & Fotheringham, Ltd.	6,743
E. Lawrance & Sons, Ltd.	6,932		
J. & C. Bowyer, Ltd.	6,885		

[The Architect's estimate, comparable with the tenders, is £6,808.]

LONDON.—For the enlargement and improvement of the infants' school on the Northey-street site, for the London County Council :—

W. Harris	£3,037 0 0
Friday & Ling	2,944 17 10
Griggs & Son	2,812 7 11
McLaughlin & Harvey	2,770 0 0
H. Groves	2,696 0 0
F. & T. Thorne	2,591 0 0
A. E. Symes	2,501 0 0
H. Kent	2,499 0 0
H. L. Holloway	2,467 0 0
T. D. Leng	2,414 0 0
E. A. Roome & Co.	2,381 0 0
J. & C. Bowyer, Ltd.	2,338 0 0

[The Architect's estimate, comparable with the tenders, is £2,350.]

LONDON.—For electric lighting work at the London County Council School of Photo-Engraving and Lithography (City of London), for the London County Council :—

E. Lawrance & Sons, Ltd.	£1,320 0 0	G. E. Taylor & Co.	£949 6 6
W. H. Gaze & Sons, Ltd.	1,269 0 0	Tilley Bros.	948 3 8
G. Weston & Sons, Ltd.	1,221 0 0	E. Newbald	834 0 0
W. J. Fryer & Co.	1,135 0 0	A. Hawkins & Sons	819 0 0
		Pinching & Walton	684 6 0
		Tredegar & Co.	612 0 0

[The Chief Engineer's estimate, comparable with the tenders, is £712.]

LONDON.—For adapting the Ponton-road Industrial School, Clapham, as a place of detention, for the London County Council :—

Lathey Bros.	£1,849	J. & C. Bowyer, Ltd.	£1,373
Rice & Son	1,847	W. Johnson & Co., Ltd.	1,362
J. Garrett & Son	1,822	Triggs & Co.	1,319
G. Munday & Sons	1,419		

REDCAR.—For erection of the memorial clock-tower. Mr. J. Howcroft, surveyor, Redcar :—

King & Co.	£300 10 0	J. F. Bainbridge	£169 18 3
M. W. S. France, Ltd.	193 9 0	J. Dobson, Redcar‡	156 10 0

‡ Accepted according to specification.

ROYDON.—For construction of sewage-disposal works and laying sewers. Messrs. Tooley & Foster, engineers, Buckhurst Hill :—

W. Jackson	£4,777 0 0	D. T. Jackson	£3,054 0 0
T. Adams & Son	3,819 0 0	P. R. Paul	2,932 0 0
Wilson, Border, & Co.	3,440 0 0	T. W. Pedrette	2,880 0 0
Kemp Bros.	3,394 5 11	W. & C. French	2,857 0 0
P. Wilson	3,325 0 0	G. Porter	2,849 0 0
Manders & Hill	3,148 0 0	Middleton & Hopper	2,840 0 0

SUNNINGDALE.—For the erection of Coronation Memorial Institute. Messrs. Roberts & Smith, architects and surveyors, Sunningdale :—

F. Pizzey & Son	£777	E. Pack	£712
H. Charman	748	J. H. Wakelin	698
W. Lucas	745	W. Watson	697
Norris & Co	733	R. Love & Co.	662

TREGOES.—For alterations and additions to the school. Mr. G. Dickens-Lewis, County Architect, Aberystwyth :—

J. James	£510 15	J. Evans	£395 0
W. Edwards	489 10	J. Davies, Ffostrasol*	355 0
D. Jones	437 0		
Davies & Jones	399 10		

WOODFORD.—For erection of a school at Madeira-grove. Messrs. Tooley & Foster, architects, Buckhurst Hill :—

F. B. Self	£2,498 19	F. J. Coxhead	£1,798 0
T. Osborn & Sons	1,993 0	W. J. Maddison	1,768 0
Fitch & Cox	1,948 0	J. Oram & Son, Waltham Abbey‡	1,656 10
Knight & Son	1,841 0		
C. S. Foster & Son	1,836 0		

‡ Recommended for acceptance.

Ham Hill Stone.
Doulting Stone.
Portland Stone.
The Ham Hill and Doulting Stone Co., Limited
(incorporating the Ham Hill Stone Co. and C. Trask & Son, The Doulting Stone Co.).
Norton, Stoke-under-Ham, Somerset.
London Agent :—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyssel and Metallic Lava Asphalte Co. (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to Forth Bridge Co. T.N. 2644 Central.

SPRAGUE & CO., Ltd.,
LITHOGRAPHERS AND PRINTERS.
Estate Plans and Particulars of Sale promptly executed.
4 & 5, East Harding-st., Fetter-lane, E.C.

J. J. ETRIDGE, Jr.
SLATE MERCHANTS. LTD.
EXPERTS IN
SLATING, TILING.
BEST WORK ONLY.
Telephone 2685 Wall, or write—
BETHNAL GREEN SLATE WORKS,
BETHNAL GREEN, LONDON, E.

PILKINGTON & CO.
(ESTABLISHED 1838),
DEPTFORD WHARF,
190 & 192, CREEK ROAD, DEPTFORD, S.E.
Telephone No.: New Cross 1102 (two lines).
Registered Trade Mark.
Poloneeau Asphalte.
PATENT ASPHALTE AND FELT ROOFING.
ACID-RESISTING ASPHALTE.
WHITE SILICA PAVING.
SEYSSEL ASPHALTE (*Direct from the Mines*).

"Drop Dry" Glazing
ECONOMICAL, EFFECTIVE. THE PERFECT SELF-SUSTAINING BAR.
Copper & Zinc Roofing.
The most Efficient and Economical System in the Kingdom.
Designs and Estimates Free on Application.
Telegraphic Address: "COURTEOUS, LONDON."
F. BRABY & CO., LTD.
Telephone: North 3032 (4 lines).
Chief Offices: 352-364, EUSTON ROAD, LONDON, N.W.
Works: LONDON, LIVERPOOL, BRISTOL, GLASGOW, FALKIRK.

912.

Coronation
nith, archi.

..... £712
..... 698
..... 697
..... 662

ions to the
Architect,

..... £395 0
stras-
..... 335 0

l at Madeira-
ts, Buckhurst

d ... £1,798 0
lison 1,768 0
Son,
Ab-
..... 1,656 10
ce.

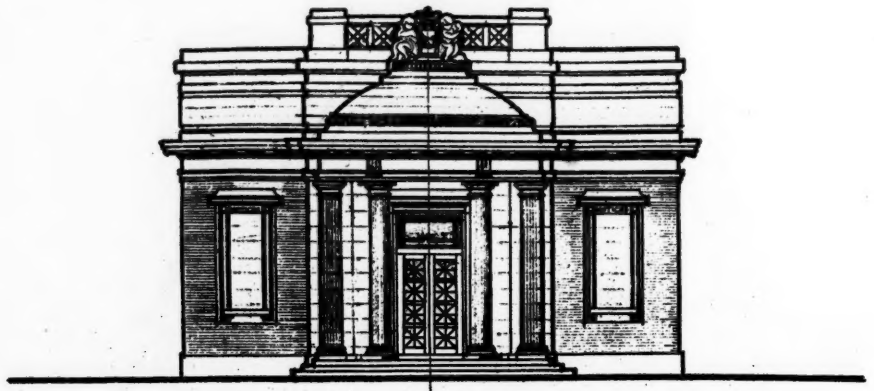
ne.
ne.
ne.
Co., Limited
C. Trask & Son,
Somerset.
. Williams,
and.

Metallic Lava
ce, 42, Poultry,
erials for damp
ouse floors, flat
lk-rooms, gran-
Asphalte Con-
.N. 2644 Central.

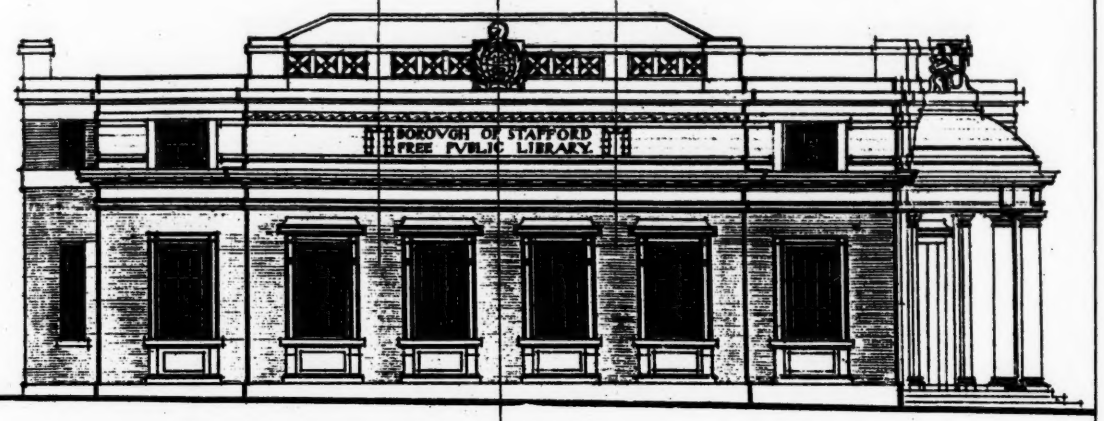
., Ltd.,
PRINTERS.
of Sale promptly
tter-lane, E.C.

N & CO.
38),
ARF,
EPTFORD, S.E.
102 (two lines).
ark.
sphalte.
FELT ROOFING.
E SILICA PAVING.
t from the Mines).
ng
AR.
ng.
elephone:
3032 (4 lines).
N.W.

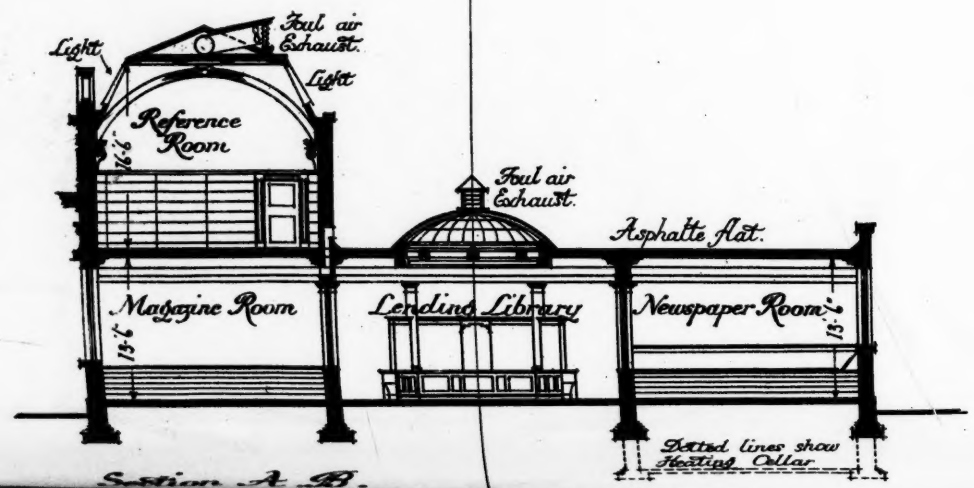
Borough of Stafford NEW PVBLIC LIBRARY.



N. W. Elevation.

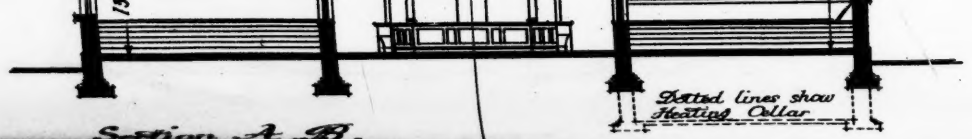


N. E. Elevation.
Lichfield Road.



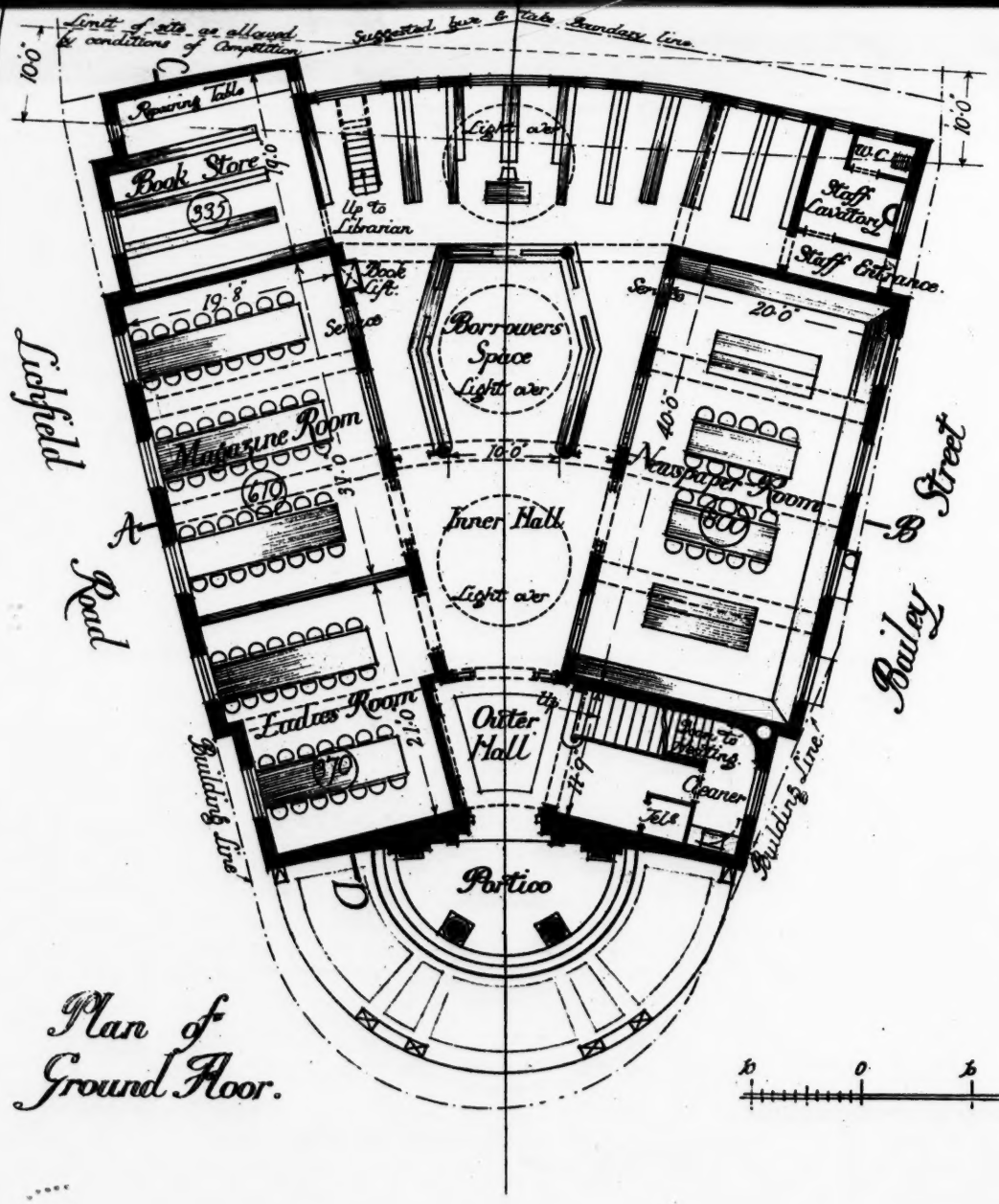
Section A. B.

Section C. D.

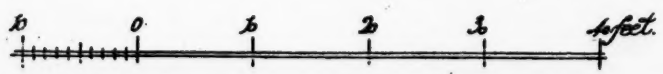


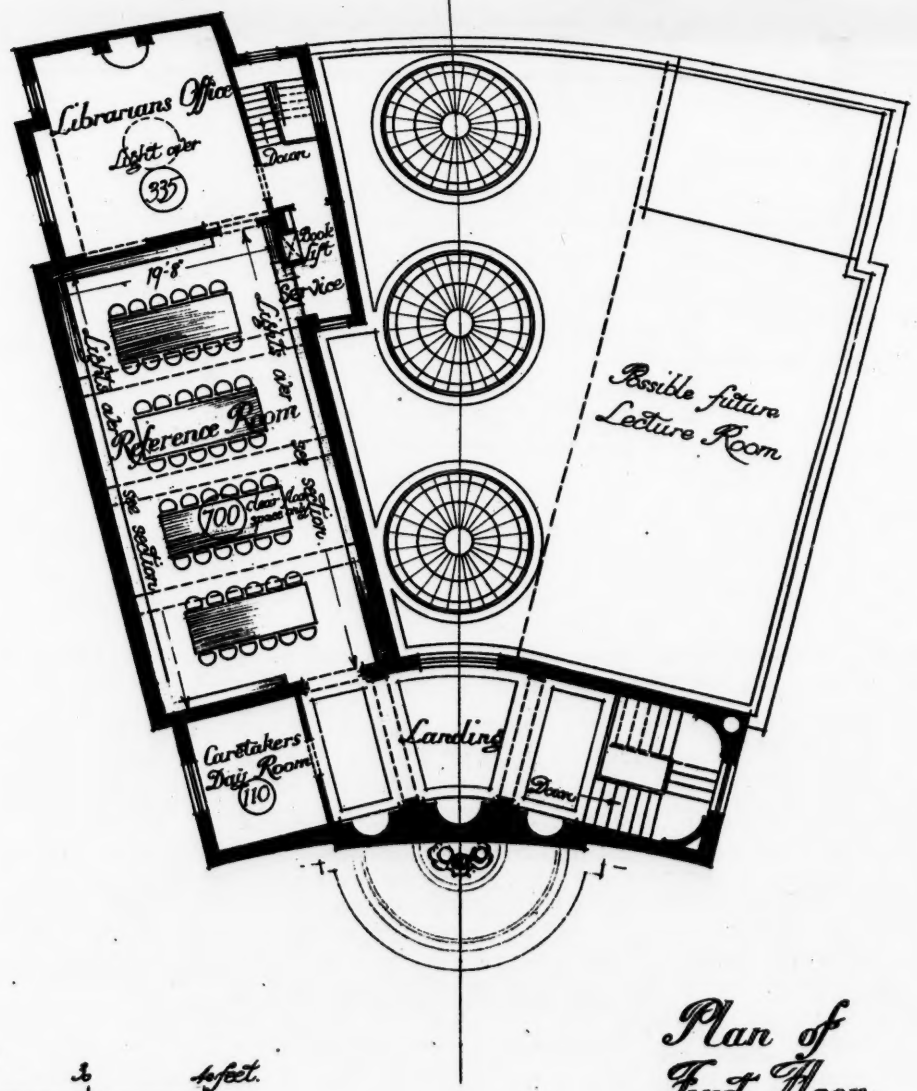
Section A B.

Section C D.



Plan of Ground Floor.



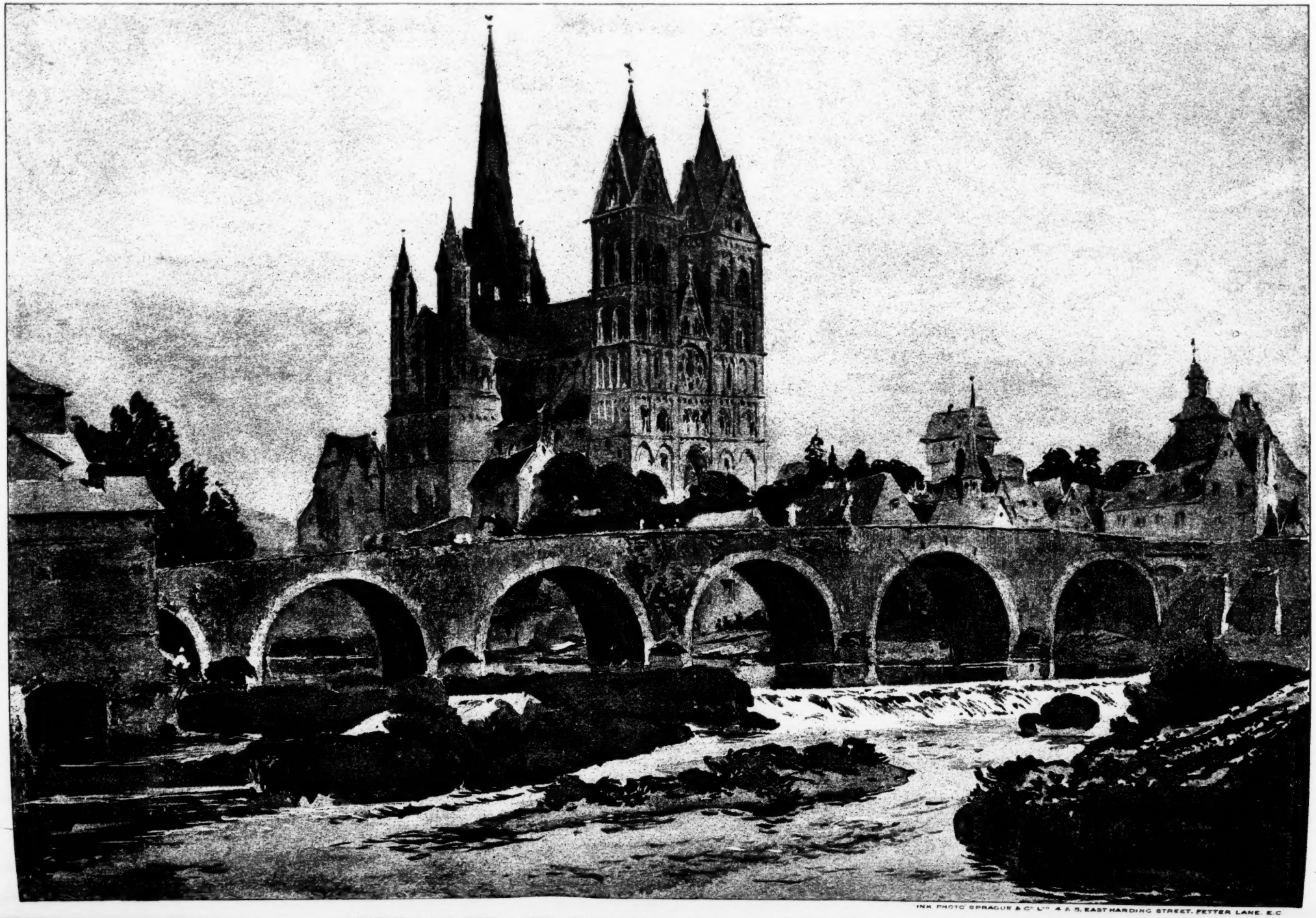


Plan of First Floor.

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C

STAFFORD PUBLIC LIBRARY COMPETITION,

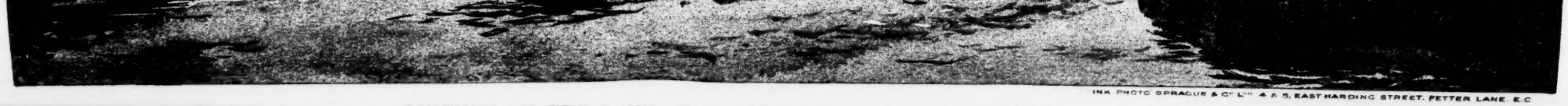
SELECTED DESIGN BY MESSRS. BRIGGS, WOLSTENHOLME & THORNELY.



INK PHOTO SPRAGUE & Co Ltd 4 & 5, EAST HARDING STREET, FETTER LANE, E.C

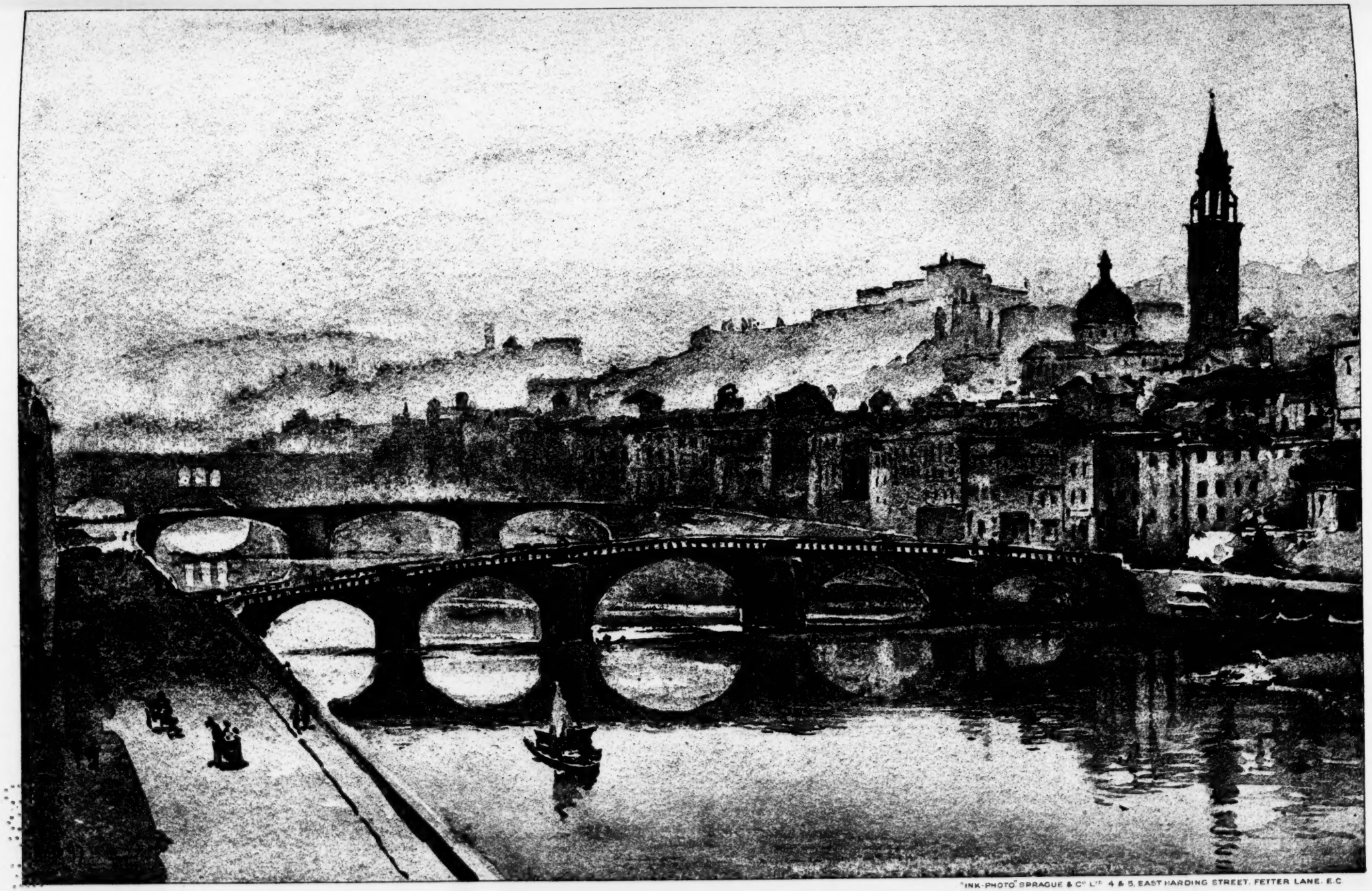
LIMBURG ON THE LAHN.—From a Sketch by the late Alfred Waterhouse, R.A

THE BUILDER, FEBRUARY 23, 1912.



INK PHOTO SPRAGUE & Co Ltd 4 & 5, EAST HARDING STREET, FETTER LANE, E.C

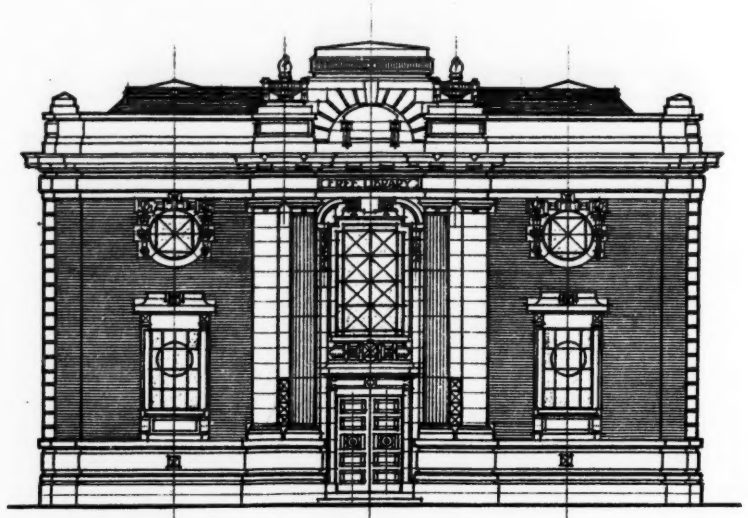
LIMBURG ON THE LAHN.—From a Sketch by the late Alfred Waterhouse, R.A



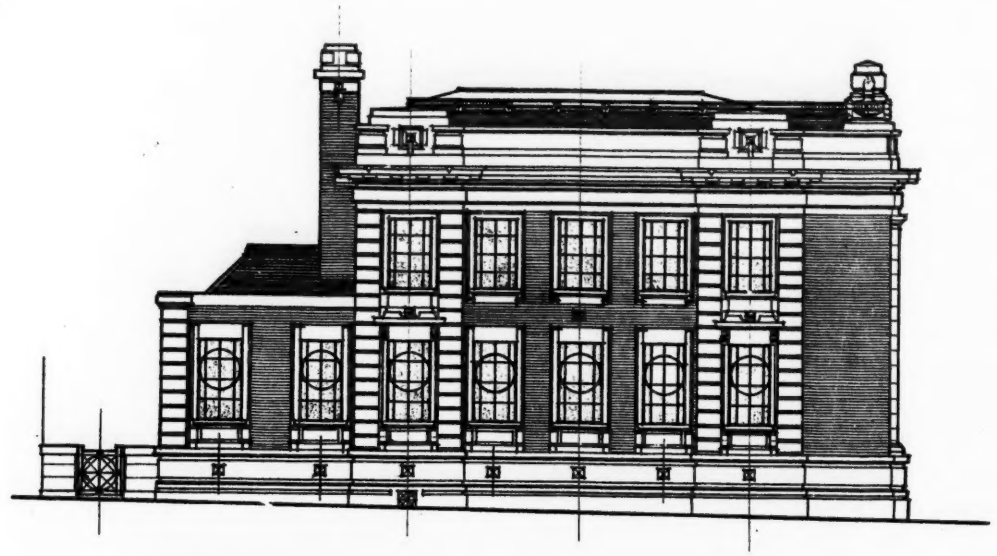
"INK-PHOTO" SPRAGUE & Co Ltd 4 & 5, EAST HARDING STREET, FETTER LANE, E.C

FLORENCE.—From a Sketch by the late Alfred Waterhouse, R.A

(Illustrating Mr. Paul Waterhouse's Architectural Association Paper on "Bridges.")



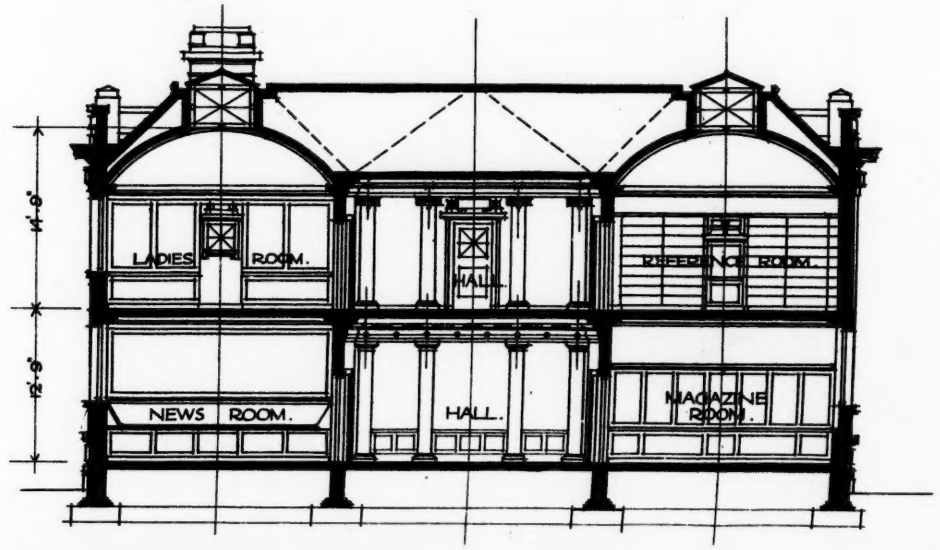
FRONT ELEVATION



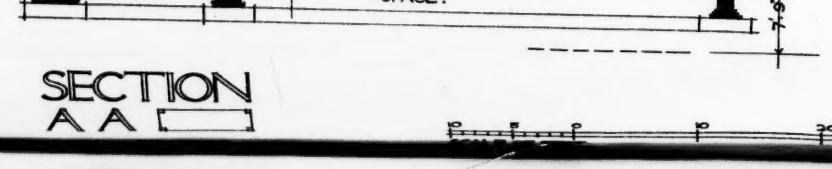
SIDE ELEVATION

LICHFIELD ROAD :

SECTION A A

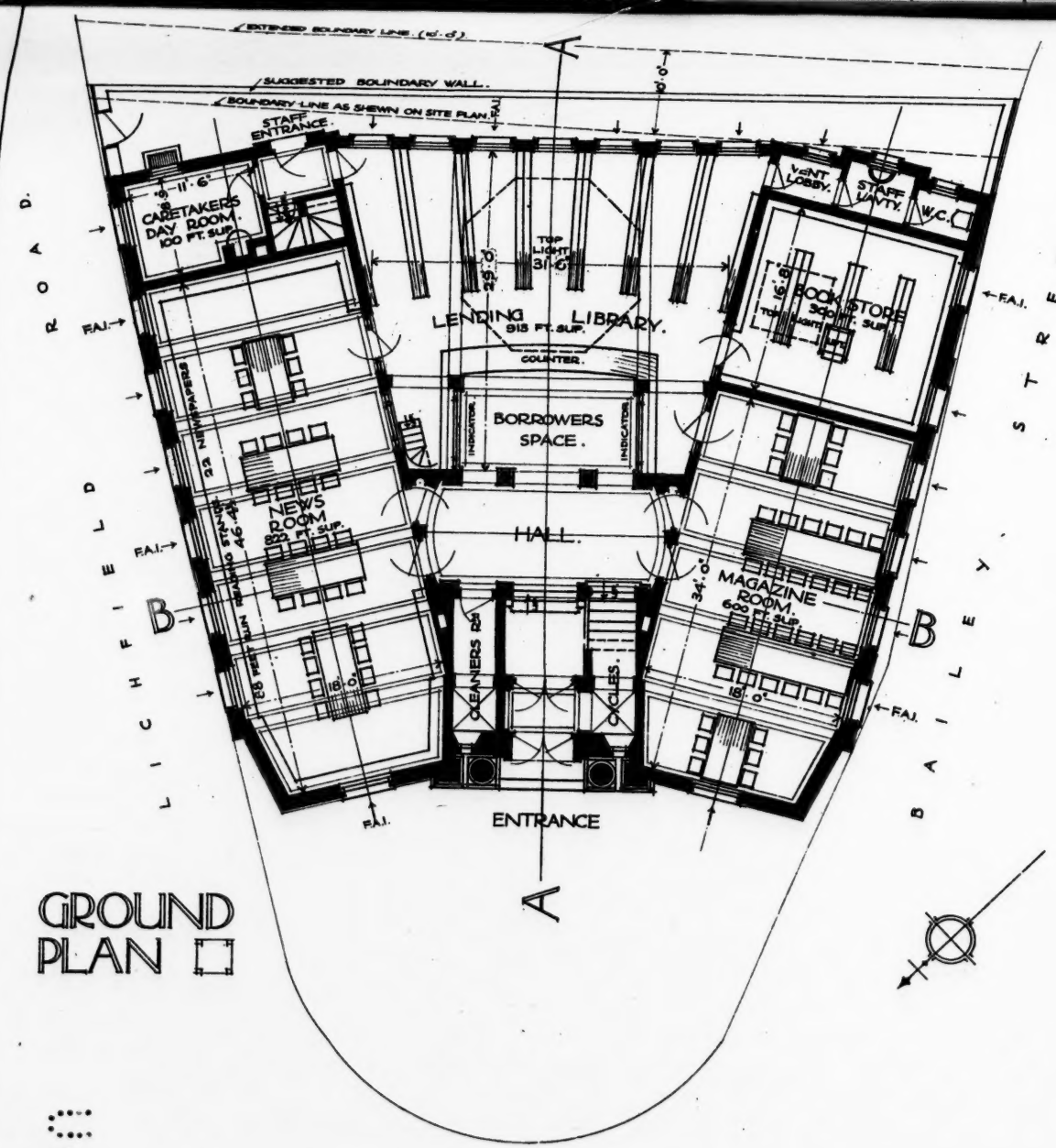


SECTION B B

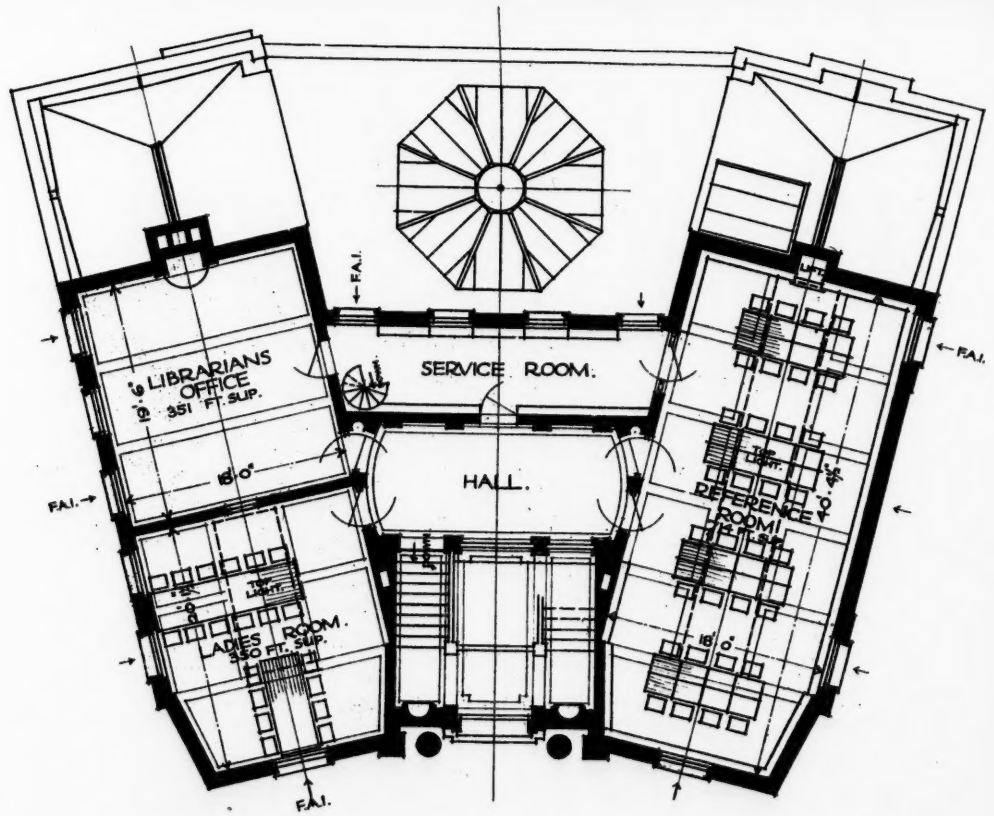


SECTION
A A

SECTION
B B



GROUND
PLAN



FIRST
FLOOR PLAN

PHOTO-LITHO. SPRAGUE & Cº LTº 455, EAST HARDING STREET, FETTER LANE, E.C.

STAFFORD PUBLIC LIBRARY COMPETITION.

SECOND PREMIATED DESIGN BY MESSRS. SUTTON & GREGORY.